Exhibit AD

SUPERIOR COURT OF NEW JERSEY
LAW DIVISION - MIDDLESEX COUNTY
DOCKET NO. MID-L-003809-18AS

KAYME A. CLARK and DUSTIN W. CLARK, Plaintiffs, v. JOHNSON & JOHNSON, et al., et al., Defendants.	104 HEARING TRANSCRIPT OF PROCEEDINGS (VOLUME I)

Place: Middlesex County Courthouse
56 Paterson Street
New Brunswick, New Jersey 08903

Date: May 29, 2024
9:02 a.m.

B E F O R E:
HONORABLE ANA C. VISCOMI, J.S.C.

ANDREA F. NOCKS, CCR, CRR
PRIORITY ONE
290 West Mount Pleasant Avenue
Livingston, New Jersey 07039
(718) 983-1234
E-mail: p1steno@veritext.com

APPEARANCES:

DEAN OMAR BRANHAM SHIRLEY LLP
BY: BENJAMIN BRALY, ESQ.
302 North Market Street
Suite 300
Dallas, Texas 75202
Attorneys for Plaintiffs

KING & SPALDING
BY: MORTON D. DUBIN II, ESQ.
KEVIN HYNES, ESQ.
1185 Avenue of the Americas
34th Floor
New York, New York 10036
-AND-
McCARTER & ENGLISH
BY: JOHN C. GARDE, ESQ.
Four Gateway Center
100 Mulberry Street
Newark, New Jersey 07102
Attorneys for Defendant,
Johnson & Johnson

ALSO PRESENT: DERELL WILSON, ESQ.
EARLY, LUCARELLI,
SWEENEY & MEISENKOTHEN

INDEX

EXHIBITS

EXHIBITS

Page 6

THE COURT: Good morning, everyone. My name is Judge Ana Viscomi. We are here on Wednesday, May 29, 2024 in the matter of Kayme, K-a-y-m-e, Clark and Dustin Clark versus Johnson & Johnson, et al., Docket Number 3809-18, to commence the 104 hearings in this matter.

Before we do, may I have appearances, please, on behalf of the plaintiffs.

MR. BRALY: Benjamin Braly here for the Clark family.

THE COURT: Thank you.

On behalf of the defendants.

MR. GARDE: Good morning, Your Honor. If Your Honor please, John Garde of McCarter & English on behalf of the Johnson & Johnson entities. With me are Morton Dubin and Kevin Hynes from King & Spalding.

THE COURT: Thank you.

So, as I -- you may be seated -- as I indicated, we are here to begin the 104 hearings in this matter. The first 104 hearing that's scheduled today is of Dr. William Longo.

Now, ordinarily in 104 hearings, it is ordinarily the party's witness, that party would go first in direct, and then that's followed by

Page 7

cross. Somehow or other, we changed that for this hearing, so I just wanted to put that on the record.

Is there anything else that needs to be placed on the record at this time before we call Dr. Longo?

MR. BRALY: Not for plaintiffs.

MR. GARDE: Not for the defense.

THE COURT: Thank you.

And do counsel wish to make a brief statement regarding the issues that are of concern in this case?

MR. GARDE: Mr. Dubin.

MR. DUBIN: Yes, Your Honor. So, there are two separate motions that were filed with respect to Dr. Longo. One is entitled Johnson & Johnson's, defendants' memorandum of law in support of their motion in limine to exclude Dr. William Longo's chrysotile testing for a Rule 104 hearing, and so that revolves around whether the identification chrysotile in the product is accurate and I think that's where we're going to be beginning and spending most of our time during this 104 hearing.

The second motion is Johnson & Johnson, defendants' memorandum -- well, motion in

Page 8

limine to exclude Dr. Longo's amphibole findings, exposure opinions and tissue findings and request for a Rule 104 hearing. So, that motion embodies three different issues: the identification of amphibole asbestos, the exposure opinions; in other words, dose levels, and tissue findings specific to the case, and so that will be addressed later and probably more briefly than the chrysotile motion with which we will be starting.

THE COURT: Okay. Thank you.

Do you wish to respond, Mr. Braly?

MR. BRALY: I would. I think by the time the hearing is over, it's going to be fairly clear that Dr. Longo follows regularly a sound methodology in reaching the opinions that he reached, and most of the complaints raised by Johnson & Johnson, if not all of them, go to the weight of the evidence that he's offering and not the admissibility of it. They have experts who disagree with them, which I think is common for these types of cases, but the methodology that he is following to reach the opinions that he is reaching is well established and understood and his experience, training and education more than accounts for his ability to provide the opinions

Page 9

that he does.

THE COURT: Thank you.

So, Dr. Longo, if you'll join us in the witness box and watch for any wiring on the ground, please, on your way up here.

THE WITNESS: Yes, Your Honor.

COURT OFFICER: State your full name and spell your last.

THE WITNESS: William Edward Longo, L-o-n-g-o, sworn.

THE WITNESS: I'm already breaking stuff.

THE COURT: I think it was already there.

MR. DUBIN: Let me know when you're ready.

THE WITNESS: Okay.

DIRECT EXAMINATION BY MR. DUBIN:

Q. Hi, Dr. Longo. Good morning. How are you?

A. I'm doing fine, Mr. Dubin. How are you doing this fine day?

Q. Good, good. Always fun to be in court with you.

So, I'm going to start out by talking

Page 10

about chrysotile. As I said, I think it's going to take us a good bit of time because we're going to have to both sort of go through and explain the process that we're all talking about, how the methods work, and then talk about your application and whether you followed those methods.

But, I thought it would be helpful to have a little roadmap and I recognize you're not going to agree with this first slide. Just about what I'm intending to show today ultimately when we get through what we have to travel through. And so, I'm going to do a couple things. I'm going to be showing some slides during the course of this and at the end I'm going to mark a full copy of those slides. Some slides I'm going to be introducing as exhibits because they have images in the backup and I want to make sure the images are on the record. So, I'm just letting you know how I'm going to proceed from an evidentiary standpoint.

But let's call up slide 1 and start our disagreements. Okay? Oh, there it is.

Can you see that?

A. I can see it pretty well.

MR. DUBIN: Your Honor, can you see the slide?

Page 11

THE COURT: Yes. Thank you.

MR. DUBIN: Okay, great.

BY MR. DUBIN:

Q. So, here's what we're going to talk about: It's obviously our position that what you're calling chrysotile in these products is not chrysotile, that it is, as I have stated here, fake chrysotile that you are finding through a method called PLM, which is a microscope and PLM dispersion staining.

The first one of these that I wrote down there, we're going to talk about this a lot, is that Dr. Longo always said TEM was the best method to identify chrysotile in talc if it's there but never uses it for Johnson & Johnson chrysotile analysis and that's true, right?

A. Up until today that's true.

Q. Up until today. Okay.

And so when we talk about these -- we're going to talk a lot about these two different types of microscopes, TEM and PLM, how the analysis is done, and how PLM introduces an element of subjectivity that can be manipulated.

But first this number 2, if you use TEM to look at a particle, let's say a particle that

Page 12

you want to know is it talc, is it chrysotile, TEM would provide you detailed chemistry and crystal structure to confirm what mineral you're actually looking at. That's also true, right?

A. That is a true statement.

Q. Okay. The next one, we'll be going through this a lot, that the type of PLM analysis that you're doing, which is called PLM dispersion staining analysis, that process of identifying a mineral starts with the analyst picking the right color. In other words, they're observing a particle under the microscope, they see a color and then they have to pick the correct wavelength of light that matches that color. That is also true, that is a part of the PLM methodology right?

A. Yes, sir. Mr. Dubin, so far you're batting a hundred.

Q. Thank you. I think we're now going to get into the areas of disagreements, right?

One of the things that I'm going to try to demonstrate today is that what we're referring to as your fake chrysotile, that the analysis under PLM is based on MAS picking the wrong colors for the analysis to make it seem like the talc is chrysotile, and you disagree with that; fair

Page 13

to say?

A. You're right on that. I strongly disagree with that.

Q. And the other thing that eventually, after we explain all the background that I'm going to discuss with you, is the idea that MAS also used a biased birefringence calculation method, and we'll talk about what that means, but presumably you disagree with that as well, right?

A. That's another statement that is not true.

Q. And I'm absolutely sure that you're going to disagree with me, and we'll see how the evidence rolls, that what you're calling chrysotile in these products is not chrysotile and we're going to be discussing why we're asserting that over the course of the day. Okay?

A. Well, to me it's not okay that you're not calling it chrysotile.

Q. Okay. I get that. And we'll get there.

All right. So normally if this was in a trial setting I probably would be spending a lot of time on your background and the money you made and all of that kind of stuff, and I am going

Page 14

to discuss your qualifications specifically as to PLM when we start to get to discussing the methods. But I'm not going to spend as much time as I normally would on money and things like that.

But fair to say that over the years, your lab, MAS, has billed plaintiffs' lawyers over 30 million dollars for the work that it's done for them, right?

A. Yes, over the 35 years, that would be correct.

Q. Okay. And let's just wait until people are settled. Sorry about that.

And we're going to start talking a little bit about a timeline of what methods you've used to look at talc and what you've said is in talc over time. And so we have sort of one of the most important benchmarks in that timeline when we look at, you were hired, you started looking at Johnson & Johnson talc for asbestos in about 2016, right?

A. I think we received the first samples in June or July 2016.

Q. Okay. And you were hired at that time by three plaintiff law firms, the Kazan firm, the Lanier firm and the Simon Greenstone firm, right?

Page 15

A. That is correct.

Q. And your company, MAS, had already had a long working relationship with those plaintiffs' firms, right?

A. That is correct.

Q. They had paid you a lot of money in the past before coming to you to analyze Johnson & Johnson talc for asbestos, right?

A. Well, that's really not fair when you say "a lot of money." The laboratory costs a lot of money to run. So yes, we have billed what would be appropriate to help the lab run.

Q. I mean, you know me, I've got a million transcripts back here. You have agreed, when somebody asked you if these law firms were looking for someone that they had paid a lot of money to in the past, you said if that was the criteria, let's hire an expert where we paid a lot of money to in the past, I guess, that would be true, right? So they had paid you a lot of money in the past?

A. Sometimes I'm sarcastic too many times on the record.

Q. Okay.

A. I doubt that was the reason

Page 16

seriously.

Q. Well, it's of no moment 'cause we're going to focus on science today, so I'm just going to let it slide.

A. Great.

Q. So, let's then, I want to talk about the work you've done at different time periods and we can start by bringing up slide 2.

A. That wasn't me.

Q. So, I've tried to break this up and we're going to talk about it in various time periods. The first time period we're going to talk about is your results from 2017 to 2019. And the reason why 2019 is the stopping point of that, so we understand, is that in 2019 the FDA reported finding chrysotile in one bottle of Johnson & Johnson and then after that you started issuing reports claiming to find chrysotile in Johnson & Johnson by PLM, okay, right?

A. Not really okay because that had nothing to do with it. We were already -- what had to do with it is because we got documents from Johnson & Johnson that they had developed a test to do heavy liquid density separation for chrysotile.

Q. I'm asking --

Page 17

A. Excuse me. Finding it in the regular way, what I call the dilution method, had nothing to do with what we did.

Q. Okay. We'll break this down then to make sure that we don't agree. So we'll look at it on a timeline and we'll see which parts of that you actually disagree with.

Before we do that, let's call up slide 3. And just to make clear, what we're going to be talking this morning, and probably most of the day, there are two general families in which asbestos can fall, the serpentine family and the amphibole family, correct?

A. I agree with you.

Q. And there's one member of the serpentine family, that's chrysotile, we're going to be talking about that with respect to this motion. Okay?

A. Yes.

Q. All right. And also if we could call up slide 4, I alluded to this already. There are different types of microscopes that you can use for your analysis and two of them we're going to be talking about and you're familiar with both of these are TEM, transmission electron microscopy, and PLM,

Page 18

polarized light microscopy, right?
A. Yes.
Q. Okay. And each of these microscopes have different methodologies that you would use if you were trying to identify whether something is really chrysotile, correct?
A. That is correct.
Q. And historically you have really considered yourself a TEM analyst, right?
A. Yes. I've done more TEM than anything.
Q. We'll talk a little bit about that when we get to your PLM qualifications.
Let's go back to slide 1, and I just want to put a little meat on the bones of the first point and I know you said you agree with that in general but I want to make sure that we have in the record the details of it, and so let's go to slide 5.
Okay. So I want to walk through and make sure that these are correct.
So, as I said, you were hired sometime in 2016 to look at Johnson & Johnson, right?
A. Yes, sir.

Page 19

Q. Okay. And for a period of years, at least between approximately 2017 and 2019, you were not reporting finding any chrysotile in any Johnson & Johnson products, correct?
A. That is correct. We weren't doing any sample preparation that would allow us to find chrysotile in Johnson & Johnson. It was all amphiboles.
Q. Right. And so that we all understand what that means, at that time you were using a sample preparation method referred to as heavy density liquid separation or a number of different ways you can refer to it. And because you were using that type of sample preparation at that time, it would largely exclude chrysotile from your analysis, right?
A. Correct.
Q. Okay. And when you did that work, after you had, to your satisfaction, pulled off heavy density liquid separation for amphiboles, you took that sample prep and you looked at it under transmission electron microscopy to see what minerals you could find, right?
A. Correct.
Q. And you gave some testimony over time

Page 20

about TEM versus PLM, you did that before you ever started using PLM to identify chrysotile in Johnson & Johnson, right?
A. It's a little misleading. If I can explain. Yes. PLM back in those days was just designed and protocols out there were just designed to find asbestos-added product, not trace amount of products. But when I did the Johnson & Johnson MDL project and decided to compare PLM, TEM, with and without heavy liquid density, it found that PLM was not worthless, as long as you did it appropriately for trace amounts of asbestos in cosmetic talcs. So that's where it all changed --
Q. Okay.
A. -- with the MDL samples.
Q. Well, let's first just focus in this period in the green back there what you said. One of the things you said is that -- first of all, as we pointed out, when you -- in that green period, after you perfected your heavy density separation, at least you were performing it satisfactorily in your lab, you chose to use TEM, right?
A. Right. But not for the reasons you're saying.
Q. Um-hum. Okay. But one of the things

Page 21

that you said is that the reason why you chose TEM and not PLM is because TEM was the better analytical method, right?
A. That's correct. But that all changed with the MDL samplings that came out in 2019, so yes. Scientists do change their minds over time.
Q. Fair enough. I'm just asking about what you were saying back then. And you said that you chose TEM because it was the better analytical method, correct?
A. That's correct.
Q. Okay. In fact, you've gone so far as to say back in that time that TEM really is the only method that you can use to determine whether asbestos is really in cosmetic talc?
A. I recall saying something like that.
Q. You said that, in fact, that it would be okay to you to only use TEM analysis but it would not be okay for you to only use PLM analysis because of its problems. Is that correct?
A. Oh, I may have said that but, of course, that's been a while back and scientists do learn new things. Sometimes people don't think so but we actually do.
Q. Okay. And when you got -- you were

actually also asked specifically back in that time about using PLM, which is your current methodology for identifying chrysotile in talc, correct?

A. Correct.

Q. And one of the things that you admitted is at least as of about 2019, it was your opinion that PLM, the method we're going to be talking about, was worthless to find chrysotile in talc?

A. Yes, I think I did say that. Fortunately, it turned out I was wrong.

Q. And one of the other things is that you said that chrysotile -- that TEM back in this green period, that chrysotile would be the -- I'm sorry -- TEM would be the best method to identify chrysotile in talc if it's there, right?

A. I probably said that sometime around there.

Q. And one of the reasons that you were saying that is because these two methodologies, TEM and PLM, they have different abilities to resolve small fibers of asbestos, right?

A. Well, it's more than that, but -- I'd be happy to explain but, yes, that's one of the reasons.

Q. One of the reasons. In other words, it was your opinion at that time, back in this green box period, that by choosing to use PLM, as opposed to TEM, you were risking missing chrysotile even if it was there, right?

A. Well, it turns out a lot of people were missing the chrysotile in cosmetic talc and a number of people found it in cosmetic talc. So, without understanding what you're looking for, because most people are -- associate with asbestos-added products, but we now know that even with amphiboles, TEM will see one side's population, PLM sees another side's population, you have to use both.

Q. We'll talk about your current opinions in a moment.

A. Oh, sorry.

Q. I'm still back in that time period. And one of the things that you had said at that time period was that you wouldn't want to be using just PLM to look for chrysotile because single chrysotile fibers or small bundles might be invisible to PLM, right?

A. You know, I don't really recall that but I assume you have -- so I won't waste the

court's time.

Q. Okay. But that is one of the potential issues with just using PLM, right?

A. Yes and no.

Q. Okay. Well, what we know is then some time in late 2019 the FDA reported finding trace chrysotile in one bottle of Johnson & Johnson, right?

A. Correct.

Q. And after that time -- so we understand that, we can -- let's just put up slide 7.

So, the FDA in one of these bottles found .00002 percent or 0.00001, you know, percent chrysotile in one bottle, right?

A. Correct.

Q. And that analysis was done using TEM, correct?

A. TEM with the dilution method, which came out to be a detection limit on chrysotile fibers of approximately five million.

Q. All right. Well, let's go back to slide 5 for a second. But no question, the instrument that the FDA was using in that analysis was TEM when it said it found chrysotile, right?

A. Well, that was AMA and, of course, they were also doing PLM.

Q. Right. But PLM was negative?

A. Correct.

Q. Okay. And so that lab, which was doing PLM to look for all types of asbestos, didn't find it, correct?

A. By PLM, that is correct.

Q. And so, you have had, in this period for several years that you've been testifying, that TEM is the best method to look for chrysotile but you do not try to replicate the FDA's findings by TEM looking at Johnson & Johnson, correct?

A. Well, absolutely not. They use a method that had such important detection limit. And yes, if you have concentrations of asbestos in the millions, you can find it by the non-dilution method. I would never use that method.

Q. Okay. Well, what I'm saying is you're a TEM specialist, you've testified that TEM is the best method to look for chrysotile in talc, and yet, following up on the FDA findings, you do not try using TEM, according to you, even once to see if it worked to detect chrysotile in Johnson & Johnson. Is that correct?

Page 26

A. That's correct, but no reasonable scientist would try to replicate that when they know those kind of detection limits. You know that bottle that had all that chrysotile in it, I think it added up to like 35 or 40 million chrysotile structures, you don't see those concentrations too long.

Q. So, first of all, one of the things about TEM is that it has the ability to find much, much smaller percentages of asbestos if it's there than PLM, right?

A. Not for the cosmetic talcs. We've gotten the PLM detection limit down to four zeros and a one and because of the size that we're seeing. Now, we're just running through the new validation with that, but we have been for the last few weeks using TEM on cosmetic talcs and we're finding chrysotile. Now, we haven't done Johnson & Johnson, so I carefully worded that slide, but we are now finding it and it's working.

Q. Okay. Well, I'm looking forward to having a supplemental deposition of you, Dr. Longo.

A. That's fine.

Q. And, again, so you haven't found chrysotile in Johnson & Johnson by TEM, so here we

Page 27

are. You have not done that for Johnson & Johnson today, right?

A. Not yet.

Q. Okay. Well, we'll see.

So anyway but your -- so as I understand it, you're saying to this group that people in cosmetic talc land, if they were just using PLM, they were using the most sensitive analysis even if they weren't using TEM?

A. No. That's not what I'm saying. Out in cosmetic talc land, they needed to be using the Colorado School of Mines heavy liquid density separation and they also needed to also need to look at something reasonable like the SG-210 Union Carbide chrysotile that has the same characteristics in what we're finding in there. So out in cosmetic talc land, there's another scientist, Mark Bailey, who's also using the CSM, TEM, and that's why we -- the first samples we analyzed were his samples, they were Avon samples and I think the mine was Vermont, and he found chrysotile in the three samples, as well as anthophyllite, and then we analyzed those three samples to verify the TEM method now that we have it.

Q. Look, you're going on about things

Page 28

that you've never spoken about in a deposition. I'm happy to address them with you, but we're talking about J&J, so let's both stay focused.

And it's still true today that even though you testified multiple times that TEM would be the best way to look for chrysotile, as we sit here today, so that's -- you've been analyzing talc since 2017 and we're now in 2023, throughout that entire period of time you have not tried once to verify whether there is chrysotile in Johnson & Johnson by TEM, right?

A. Yes and no. There's a good reason why we haven't but, yes, you're correct, but, no, it's not just that we wanted to ignore it. We want to make sure the CSM method was optimized so that we could, one, do another validation on it, and, two, know what our detection limits were.

Q. Okay. We'll be talking about that CSM method in a minute, but I just want to finish filling out our chart here, and so I'm going to mark as the first exhibit CX00024. I thought this would just be handy because -- thank you.

THE COURT: What is the marking on this one, D-1?

MR. DUBIN: It will be D-1. We'll

Page 29

call that up. I'll give you my copy. We don't really need to go through this in depth but...

BY MR. DUBIN:

Q. So, we talked about the fact that the FDA findings were in one bottle, but using your PLM method, the one that you're identifying chrysotile by, this is a chart that was, I think, put together by the DOBS firm summarizing some of your PLM results.

But using this technique that we're going to talk about, your mineral identification in, you essentially find chrysotile asbestos in every product that you examined, right?

A. That's almost true. We have a negative here and there, so I would say maybe 5 percent are negative.

Q. Five percent are negative?

A. Somewhere around there.

Q. 'Cause we'll be going into that at some point if it's really 5 percent. But in this chart that was prepared for your results in the Plant case by DOBS it's a hundred percent right?

A. Yes.

Q. Okay. And so we can go back to that slide 5.

Page 30

In fact, based on your current testing, you've also offered the opinion basically that any bottle of talc that was sold in North America that used a mine source that is relevant to US sold talc will have asbestos in it, any bottle, right?

A. If you can -- yes, yes, sir. If you can get the detection limit, every mine in North America had asbestos in it.

Q. And so, in other words, in a case let's say somebody went in and bought only three bottles from a particular retailer, you would come in and say, well, every one of those bottles if it's a US sourced talc that it likely has asbestos in it based on the way you are currently doing your analysis, right?

A. Well, no, not just based on the way that I'm currently doing my analysis. Based on the way all the previous work has been done, mainly by J&J, based on other scientists who are finding it. So it's not anything to do with the analysis. We're just using standard methodology, just made it more sensitive.

Q. And so we're going to go next to slide 8, because I'm going to start talking about

Page 31

that period of time now in the red box but before I do that, I want to back up a little bit and talk about historical testing bring your lab of cosmetic talc.

And were this a regular proceeding, we'd be going through this in more depth but perhaps we can do this in a little bit of a summary fashion.

A. You're going to make it less painful for me. I appreciate that.

Q. A little bit.

So, when you were hired and started to appear in cases involving J&J, one of the obvious questions that was asked of you many times was, well, have you ever looked at cosmetic talc before you were hired in cases against Johnson & Johnson so that people could compare what you concluded now versus back then, and you were asked that kind of question a number of times, right?

A. That is correct.

Q. And so, 10 times, probably 10 times under oath after being hired in cases against Johnson & Johnson, you swore that MAS had not tested cosmetic talc before the time when it started working in the Johnson & Johnson cases, right?

A. That is correct.

Page 32

Q. And then we started to identify or find old transcripts that reflected you talking about MAS having tested cosmetic talc in the past, right?

A. Yes, sir.

Q. Okay. Some things that you had said, that you looked for asbestos in baby powder, you've looked, you have not found it; that asbestos in cosmetic talc was an urban legend; that unless talc came from New York, Upstate New York, it was clean, and the like. There were a number of transcripts we don't have to go through them all, but they're reflected on this slide, right?

A. Correct. You only missed one, if you want to go through them all.

Q. Not doing it today.

But suffice it to say, so my question to you is: Back in that -- one of the things that you have said is that, well, during that time, you weren't using the heavy density liquid separation technique for amphibole and that may be why you had missed some amphibole, right?

A. Yes, I probably said that.

Q. Well, during that time period would you have been using TEM to look for both chrysotile

Page 33

and amphibole?

A. I wasn't involved in the analysis but what I can see is they used both TEM to find out whatever asbestos was there.

Q. Okay. And did they use PLM?

A. Yes.

Q. Okay. So, to the extent that you were looking at these cosmetic talcs back in that time period by PLM, MAS was not reporting to have found asbestos, right?

A. Well, if you move that chart just to 2013, we did find asbestos. We found tremolite, 10 million in one and five million in another Cashmere Bouquet samples that, again, I didn't know about. So, not only was I hiding the negatives, I guess, I was hiding the positives, too.

Q. Let me make sure because we can argue about that all day long. Let me focus the question to make it a little cleaner.

During that time period in the blue range here, to the extent MAS was using PLM, which is the type of microscope we're going to be talking about today, and looking at cosmetic talc under a microscope, it was not claiming to see chrysotile, correct?

Page 34

A. For the three reports that we have, that's correct.
Q. Okay. And so I want to talk about this idea of concentration for a second because you've raised that a number of times in terms of sample prep.
And as we said, one of the explanations for your saying that you didn't see amphibole by TEM back in that day was that you weren't using concentration, right?
A. We didn't have -- that's right, we didn't have the detection limit, except for those two which had so much tremolite in them that you wouldn't need the concentration method.
Q. So, slide 9, I want to talk a little bit about the concentration method as it relates to chrysotile. Okay?
A. Yes, sir.
Q. And so, it's a different concentration technique than you -- in some respects than you use for amphibole, right?
A. Not really different. It's the same methodology that's been used for hundreds of years.
Q. Okay.
A. It just changes like what you do with

Page 35

heavy liquid density is you change the density of the liquid you're using to correspond to what you needed to either make the asbestos float or sink.
Q. Well, one of the things that we know because if you were to say, and I think you've implied this a few times, well, in the past I wasn't finding chrysotile by PLM because I wasn't using a concentration method, one of the things that we know is that you currently claim to be able to find chrysotile in these products both with and without concentration, right?
A. Yes, sir. But to be fair it was only after we got the Union Carbide, what I call standards, so that the individuals knew what they were looking for because they're so small, so, there was a learning curve here. We're scientists. We try to come up with better ways to analyze things.
Q. And so you're mixing topics because you're now talking about whether -- what types of chrysotile you should be comparing to. I'm focusing on the concentration method. Okay? Okay? Can we talk about that?
A. I apologize. I thought I was answering your question on why our analysts were now finding it with and without concentration method.

Page 36

Q. Okay.
A. Maybe I misunderstood what you were asking.
Q. I just want to know what the variable is that changed, okay, that changed so that now you're identifying it. So, I'm exploring whether or not that is the use of concentration. So, that's what we're going to talk about now and, trust me, we'll be talking about Calidria. Okay?
A. The variable that changed is that we got our hands on the Calidria SG-210. That helped the analyst understand what they were looking for since the SG-210 has all the same characteristics of what we're finding in the chrysotile. That's what changed.
Q. Okay. Trust me, we're going to talk about that.
When was the first time your lab ever examined Calidria chrysotile?
A. The first time?
Q. Yep.
A. I think the first time is when we looked at some Visbestos some years ago under court order, and this was like in 2015 or '14, and we did PLM analysis there. And if you go to your Exhibit

Page 37

25, you can see the PLM analysis and the size ranges, the length and the width, back in 2017 or '15, are identical to what we're seeing with the SG-210 today and it's identical to what the size of the chrysotile is that we're seeing in cosmetic talc.
Q. And, again, we're going to talk about that and I want to focus on concentration right now.
And so, even, for example, in 2021 you were already using a heavy density liquid separation method for chrysotile, right?
A. Yes, sir.
Q. And you were asked and you agreed that the use of that concentration method really wasn't improving your ability to detect chrysotile under PLM in comparison to just doing it the standard way, right?
A. That's what we found then, yes.
Q. And if we look at charts of your results, for example, I think this is slide 10, this is just an example of some of your results, we'll see that both with and without concentration you're routinely reporting chrysotile in the samples for Johnson & Johnson, right?
A. Correct.

Page 38

Q. And when we talk about concentration, if we go back to slide 5 for a second, concentration is a sample method, it's not a microscope, right; sample preparation method, apologies?
A. Yes. It's a sample preparation method for either TEM, PLM, SEM, whatever you'd like to use.
Q. Right. So, you can take the results of what you get from the concentration and you can use it with a variety of different microscopes, right?
A. Correct.
Q. And so, the concentration method, when you developed the concentration method for amphiboles or when you had it adequately tested in your lab, you chose to take what you got from that concentration sample prep and look at it with TEM, right?
A. And PLM, both.
Q. Eventually PLM, first TEM, right?
A. First TEM, then PLM for the MDL samples also. We were comparing.
Q. But when you got your chrysotile concentration method worked out in this red period, you did not take that and look at it under TEM for

Page 39

Johnson & Johnson, right?
A. Again, I apologize. It's a little misleading. You've got it going all the way to 2023. We have just come up, working in concert with another laboratory, with the heavy liquid density, the amount of spin time, what we've been waiting for, to do this.
Secondly, there is no requirement anywhere that once it's positive by PLM, that you have to do TEM to verify it. Not EPA, not OSHA, not NIOSH, nobody, and even FDA has come out and said if it's positive by PLM, you can stop.
Q. Okay. We're going to talk about all that but I asked you a fairly simple question, right?
When you -- before when you were looking for amphiboles, you took the concentration and then you looked it under TEM for Johnson & Johnson, you took the concentration, you only looked at it by PLM, right to today?
A. It's misleading how you're saying that.
MR. DUBIN: I'm sorry, Your Honor. Can I please have the witness directed to answer my question.

Page 40

THE COURT: If the witness is saying that it's misleading --
MR. DUBIN: Okay. Go ahead.
THE COURT: -- then I'm going to let him explain.
BY MR. DUBIN:
Q. You can explain how it's misleading.
A. Well, you have to understand --
THE COURT: I'm sorry.
MR. DUBIN: I apologize.
A. -- what was in the literature, say, Blount, amphiboles; what was, you know, New York, heavy liquid density, amphiboles. It was all worked out.
When we hit the chrysotile, looked at the chrysotile, the overwhelming feeling was can't do it. Even in the ISO 22262-1, it said it's theoretically possible but not practical. So, there was a lot of research work that had to be done and we wouldn't even have tried if we didn't come across Johnson & Johnson's heavy liquid density from the Colorado School of Mines. That took a lot of tweaking, so to speak. So, the amphiboles was there. You had the Blount method already published, et cetera, so it's either use, you know, 2.81 that

Page 41

Blount says, or the 2.65 that the ISO 22262-2 said, one. With chrysotile there was no such protocol, except for Colorado School of Mines couple-page protocol.
Q. Okay. Very simple question: When you had PLM, you got the concentration you looked under TEM -- sorry.
When you were looking for amphiboles you had concentration, you looked at it under TEM. When you're switching to chrysotile, now you are taking the concentration and only looking at it under PLM for J&J, is that true or false? I mean --
A. It's both yes and no.
Q. So, you do look -- so, you do, did use TEM for Johnson & Johnson?
A. No. I think I already stated that we have not done Johnson & Johnson. What we have done so far is Avon products. And one of them happened to be sourced from Vermont.
Q. And so let's then talk a little bit about the impact of the choice to use PLM verse TEM. Okay? And I want to talk a little bit about those different methods. So, if we can go to slide 11.
So talk a little bit about mineral identification. We're going to get into PLM a lot,

Page 42

but let's first do TEM because it's fairly quick.
So if we then go to slide 12, these are -- the things below are not chrysotile, they're amphibole. But within of the things that TEM can do is if you find a particle and you want to know is it talc, is it chrysotile, it can provide you detailed information on chemistry and on crystal structure to identify the proper mineral, correct?
A. Correct.
Q. Okay. In fact, you have said if you use a TEM, if you choose to use a TEM, it is fairly simple to tell whether or not you are, in fact, looking at chrysotile as opposed to talc, right?
A. Correct.
Q. Okay. And now let's talk about PLM and the additional dimension that adds and how it can then be manipulated as we'll eventually say by an analyst.
Before I get there, though, I want to just talk a little bit about your PLM qualifications. Okay? And so, slide 13.
Fair to say that as of 2019, which is right before you started to issue reports claiming to find chrysotile in Johnson & Johnson, you said that you personally do not do PLM analysis?

Page 43

A. That's correct.
Q. And, in fact, you said that as of 2019 you had never analyzed a sample of talc for the presence of asbestos from start to finish using PLM, correct?
A. Correct.
Q. And at least as of 2023, when we last asked you, you said you had never taken any classes in the type of PLM analysis we're going to be talking about which is referred to as PLM dispersion staining, not a single class, right?
A. No, sir.
Q. So, it's correct you didn't take a class, right?
A. Never taken a class in PLM analysis to understand how to identify asbestos in asbestos-added products.
Q. You are a self-taught PLM analysis -- analyst, right?
A. Yes, sir. I don't want to sound, you know, braggadocios, but I have a Ph.D. in material science and engineering where you know everything about every type of microscope, et cetera, and typically Ph.D. levels don't take basic PLM classes. I know the science really well on PLM. I could

Page 44

analyze those samples but it would take me all day so I don't do it.
Q. Okay. We'll talk more about that a little bit later but...
And if we look at the reports in which MAS has claimed to find chrysotile in Johnson & Johnson, you can see the names of the people who actually did the analysis, right?
A. Correct.
Q. And you are never listed as the analyst?
A. Well, the only people that is listed as the analyst is the person that goes from start to finish. When I sit down or there's a structure that there's some debate on it and I sit down and look at it and go through it, I don't put my name down for one structure. That's not fair.
Q. Okay. But, again, the analyst would typically be somebody like a Paul Hess, right?
A. Correct.
Q. Okay. But you, I think you just said you feel comfortable answering questions today about PLM dispersion analysis and how it's done at MAS, right?
A. Yes, sir.

Page 45

Q. Great.
So, let's just start talking about the differences. We've already said it's a fairly simple matter to identify chrysotile with TEM. I want to talk a little bit about how to identify minerals using PLM dispersion staining. First, we're just going to walk through a bit of the process before eventually we're going to start looking at your images in light of what we have discussed. Okay?
And so, if we just remind ourselves first, slide 1 'cause we're going to be talking about one of these topics and I think you agreed with it. 3, PLM analysis starts with the analyst picking the right color and I think you agreed with that, right?
A. I agree.
Q. So, I want to start to explain how this works, anybody who's sort of following along from the gallery don't worry, we're going to be going back in each concept multiple times. All right. And we can start out a little bit looking at slide 15 as an example. And I think we were going to introduce as, I guess it's Defense 2, just a copy of the ISO standards that will be D-2, from which

Page 46

some of this will be drawn. Thank you.
MR. DUBIN: Would Your Honor -- do you want a copy?
THE COURT: No, I don't need one, but thank you.
MR. DUBIN: No problem.
THE COURT: Is D-2 a combination of standards or one standard?
MR. DUBIN: It should be one standard, Your Honor.
BY MR. DUBIN:
Q. So, we're going to be talking a good bit about what colors you should see under a microscope for chrysotile, what colors you're calling things. I don't want to get there yet. I just want to talk about the process. Okay?
And so, what we're looking at here is an image in parallel, and we'll talk about why that's significant, of ISO reference chrysotile in 1.550 oil, right?
A. The 1866b NIST standard from Black Lake, Canada, Johns-Manville's source, yes.
Q. And so, again, just to talk about the process, and we'll talk more about this later, when you do this type of analysis, you have to select a

Page 47

refractive index oil, right?
A. Yes.
Q. And the colors of particles can be slightly different depending on which refractive index oil you use, right?
A. That is correct.
Q. So, we're going to be talking a lot about two different periods of your work but right now the refractive index oil that we're going to be focusing on is 1.550 and that's the oil that's used for this reference image, right?
A. Yes.
Q. Okay. And so, if we look at the steps that happen, let's assume I'm an analyst and I'm looking down the microscope and I see this structure, let me first ask you: What would you say, and we'll explain what this means, what the refractive index of this particle is based on looking at it?
A. I would say the majority of what we're looking at is in the 1.556 1.557 range and people always call it magenta.
Q. Okay.
A. For a big bundle of chrysotile like this, that's not surprising.

Page 48

Q. Okay. But if we go to the next step, just so you understand the process, slide 17 -- sorry, actually, it's slide 16 first.
So what the analyst will do is they will observe the particle under the microscope in the refractive index oil and they will determine what color they say they are seeing, right?
A. Correct.
Q. And then the next step on a very basic level, if we go to slide 17, is that that particular color will be associated with a wavelength of light, right?
A. Yes.
Q. And so, here if we take that sort of magenta-y color, that would be approximately 540 nanometers if you're converting it into a wavelength of light, right?
A. Yeah, 540, 530, right around there.
Q. Okay. And we can show which it is but the next thing you do, the next step, if we go to slide 18, is that you take that wavelength of light and considering what oil you're using and temperature and things like that, you can then convert it into what's known as a refractive index number or RI number, right?

Page 49

A. Yes.
Q. Okay. And we're going to be working with those numbers a good bit today. And there is an image here of an individual, Dr. Su, and there are tables and methods that are used to perform this type of analysis that were developed by him, right?
A. This analysis?
Q. Yes, this kind of PLM dispersion staining analysis.
A. No. I would give the credit to Dr. Walter McCrone back in the early '70s.
Q. You use the Su tables as part of your analysis?
A. Yes. He gives them out when he audits your lab. So, we have them there. The analyst, especially Mr. Hess who's been doing this for, I don't know, 40 years, but we always use them because it's handy.
Q. Do you recognize Dr. Su in this courtroom?
A. I'm trying to remember the last time he came and audited our laboratory.
Q. I mean right there.
A. Right where?
Q. Right there. Can you please stand

Page 50

up, Dr. Su?
A. Oh, well, there he is. Hey, Dr. Su.
Q. Do you recognize Dr. Wylie?
A. Dr. Wylie, of course, well, I wasn't looking very hard. Let me see.
Anybody else I need?
Q. Me.
A. I know you.
Q. And so we're going to talk a lot about these numbers and we're going to talk about Dr. Su's method and your reliance on it but there's another part of this that I want to explain and when you call something chrysotile, you focus very heavily on what is known as birefringence right?
A. Correct.
Q. And so we're going to have some witnesses talk about later how birefringence is or isn't a part of this analysis but for purposes of today, we're going to assume it is and I'm going to focus on your opinions about birefringence.
And so, birefringence is, to introduce the concept, and as I said, trust me I'm going to do my best to do this multiple times in a simple way, if we go to slide 20, there's a basic formula for birefringence which is that you take the

Page 51

refractive index in parallel, and I'll discuss this in a second, you subtract the refractive index in perpendicular and that leads to the birefringence value right?
A. Correct.
Q. And the reason why we have -- we've talked about -- what we were just doing a second ago is, and I guess we might as well go back to that slide 18, so we're referring to these RI values, those are like the values that we see here, like 1.556, right?
A. Correct.
Q. And the reason why we have two different RI values in this equation and if we can go back to slide 20, is because when you're looking at something that is in the shape of a fiber or is elongated, you measure that refractive index in two different orientations, parallel and perpendicular, and then that gives you the data that goes into this formula, correct?
A. Correct.
Q. Okay. And so, one of the things that has been, and, again, you made specific colors on here but I just want everybody to understand what your opinion is so we can talk about it, if we go to

Page 52

slide 21, one of the bases of your, primary basis of your opinions is that the particles that you are finding and calling chrysotile are chrysotile because they have what is known as a low birefringence value, right?
A. Correct.
Q. And that is as opposed to -- now, talc we're going to talk about what color talc can be but sometimes talc can appear in an elongated or fibrous form also, just like other fibers, right?
A. That, and also if you get talc plates on edge, it'll give you the same type of birefringence.
Q. Right.
A. If it's elongated or, you know, metamorphic off the chrysotile or amphiboles, one of those.
Q. But let's, you know, again -- so, for example, if we look at the chrysotile reference, the reason why I have magenta and this darker blue here is that the chrysotile reference sample and we'll see the perpendicular in a moment in ISO, it's sort of magenta in parallel and then a dark blue in perpendicular, right?
A. That's what it shows.

Page 53

Q. Okay. Whereas talc, typically -- so let's back up a second and understand this. So, talc typically is in a plate form, right, almost like, I guess a dinner plate, right, but floppier?
A. I guess. No, it's platy and you can get plates stacks up, so if it gets on its side, like in PLM, then you will get --
Q. Blues?
A. You will get a biaxial-type dispersion. If it's just flat, no, because you've got the B direction.
Q. Let's assume it's flat, we've got the flat plate perfectly oriented flat?
A. Okay, all right, we're flat. We're all stacked up.
Q. Flat. You're looking at it just like that, the typical color is going to be yellow of a talc plate, right?
A. Yellow, goldish color.
Q. We'll talk about the goldish color. But some shade, at least you can agree, of yellow, right?
A. Gold -- yellow gold I would call it.
Q. Okay. And then if you have a fiber, let's assume it's a real talc fiber, then when

Page 54

you're putting it in perpendicular, you can start to also see blues, right?
A. Correct.
Q. But typically brighter blues than you would see from a chrysotile in perpendicular, right?
A. Brighter blues, brighter yellow golds.
Q. And so we'll talk about what we mean by low birefringence, but essentially you're looking at the distance between the color in parallel and the color in perpendicular on a color bar, right?
A. Yes. You're basically looking at the difference that's correlated by the refractive indices.
Q. So, the closer the colors are together, the lower the birefringence; the farther the colors are apart, the higher the birefringence?
A. Correct.
Q. And we can just see what I mean by that, let's use an example just to also look at reference chrysotile in perpendicular, call up slide 22.
So this is ISO reference chrysotile in a perpendicular orientation and that's the color that is observed in that -- for that particle,

Page 55

right?
A. Correct.
Q. And when I mean closer together and farther apart, you see how the magenta color on that color bar and the dark blue color on that color bar are closer together than the brighter yellow on the color bar and the brighter blue on the color bar, right?
A. Correct.
Q. And that's why we say that chrysotile has a lower birefringence, right?
A. That is correct.
Q. Okay. Great.
And now I want to start talking about assessment of colors in your laboratory and I'm going to start out -- and, again, you agree that we just talked about this birefringence calculation but the birefringence calculation itself, the accuracy of it, all starts with whether you're picking the right color to begin with, right?
A. Correct.
Q. Okay. Great.
So, now we're going to break down the work that you've done into two general time periods. The first time period that I'm going to be talking

Page 56

about is predominantly when you were using a microscope with a Tungsten lightbulb. Okay? So, let's go to that Longo slide 23.
So, we're going to explain this in quite some detail but the reason that I have a lightbulb on here is that for the initial several years of claiming to -- actually, how long was it? Well, for the initial period we're going to talk about, when you were analyzing Johnson & Johnson product for talc using a method based on color, your microscopes had Tungsten lightbulbs in them, right?
A. Correct. Incandescent lights, like most all these Olympus were.
Q. And those Tungsten lightbulbs were shining what you said is a golden yellow orangish light on to the particles that were being observed for their color, right?
A. Correct.
Q. So, for an analysis based on assessment of color, you were using microscopes with colored lighting, correct?
A. It had a yellowish to it, yes, but you can compensate for it. It didn't cause any analytical problem.
Q. We'll see.

Page 57

And so, I want to look at -- again, I think what you said is that talc plates in 1.550 should generally be yellow, right?
A. Yellowish gold, more gold than yellow.
Q. Okay. We can look at just an example of that, it'll be D-3, I guess. Let's mark the USP or this slide with the backup from it, however.
A. Mr. Dubin, I think that's an LED bulb.
Q. Right, that's not yours, that's your -- no, that's an LED -- that's a --
A. Is it?
Q. -- Tungsten. It has those wide things. I did my best. I almost brought a lamp but, anyway, we'll mark this as D-3.
Do I owe anybody else a copy?
So, I just want to look as an example of some -- a talc image that is taken in the same oil from the USP or United States Pharmacopeia document to see what talc should generally look like and we can call up slide 25.
And so, here we see another reference image of talc. There's also -- there's a chrysotile fiber that they've spiked into the end of the talc.

Page 58

So, first, just let's focus on the talc.
So, when we're talking about talc and talc plates, we're talking about these more rounded or sometimes squared off objects, right, because that's the typical appearance of talc, correct?
A. Correct.
Q. And so we're focusing on the yellow stuff, right?
A. Yellow gold. I say that's more gold than yellow.
Q. Okay. And then even though this is, it looks like it's parallel, this is actually a picture of chrysotile in perpendicular orientation so we see that classic dark blue, right?
A. Are we looking at the same thing?
Q. I think so. That's parallel.
A. That's parallel.
Q. Okay. That's parallel. The other one was perpendicular, so they clipped a different image. Thanks.
A. All right. Minus one on your quiz.
Q. I know, you got me.
So anyway, we're going to focus on parallel for a little bit, about what -- let's look again -- before we get there, I want to remind

Page 59

everybody if we go back to slide 15.
So, this is the chrysotile reference image in parallel, right?
A. Yes, sir.
Q. Okay. Now, I want to take -- start taking a look at some of your images and let's -- we can mark as an exhibit with the backup -- what number? So, this will be D-4.
So what I've tried to do is at least the first time I'm using each image, I've tried to copy the relevant page for you so you can look at the image as it existed in your reports that goes with the slide.
THE COURT: Before you move on, could we identify these exhibits as we go along on the record?
D-3, for example, is that part of the USP?
MR. DUBIN: It is. Sorry, yes, that was part of the USP.
THE COURT: And what's D-4?
MR. DUBIN: D-4 is coming from his report. It's going to be an image of the alleged chrysotile from an analysis report dated 9/16/2020.
MR. BRALY: Mr. Dubin --

Page 60

(Mr. Braly and Mr. Dubin speaking to each other.)
BY MR. DUBIN:
Q. Just so we know, because I think plaintiffs' counsel said he wants to use the M numbers, let's say M71109, M71111. And so the image that we're going to be discussing first is, I think from page 296 of that report. Okay?
So, again, just to make sure that we're on the same page, chrysotile parallel according to the reference image, I want to look at the first image of what you are calling chrysotile in Johnson & Johnson.
And so if we can then call that up, that will be slide 26.
Okay. So, this is an example of what you were calling chrysotile in a Johnson & Johnson product, correct?
A. Yes, sir, that's correct.
Q. Okay. And we can see that this particle is not magenta in parallel; it's yellow, right?
A. Yellow gold.
Q. Okay. And in fact, I think you said that during, at least during this time period,

Page 61

before you switched microscopes, and we'll get to that, that the particles that you were identifying as chrysotile in Johnson & Johnson's products were typically in parallel yellow, you said maybe sometimes a bit of red, and we'll talk about that red color at some point.
A. Yellow gold.
Q. Yellow gold.
A. What's on the image itself versus what's on -- what's on the Elmo, it's different. But most of them were in, you know, 1.565 to 1.70 range.
MR. BRALY: I have kind of an objection. This says Chinese talc (inaudible) you keep saying Johnson & Johnson product --
THE COURT: I'm sorry. You're going to have to speak louder.
Are you objecting? Are you objecting to this exhibit?
MR. BRALY: Yes.
THE COURT: Why?
MR. BRALY: Not to the entire exhibit, just the characterization of it. This is Chinese talc, it's 11 samples.
MR. DUBIN: Right, Johnson & Johnson.

Page 62

MR. BRALY: Right, okay.
MR. DUBIN: So, I don't understand.
MR. BRALY: Fine. Go ahead.
MR. DUBIN: Okay. Thank you.
THE COURT: You were objecting to how it was characterized, correct?
MR. BRALY: That's right.
THE COURT: Okay.
MR. DUBIN: Okay.
BY MR. DUBIN:
Q. They're Johnson & Johnson bottles that were sourced in from Chinese talc, correct?
A. These were splits of Chinese talc out of the mine, if I remember correctly.
Q. So, it's Guangxi, China talc, right?
A. Yeah, that whole area. One of the four mines.
Q. I see.
All right. So, any way, this is typical of your images of Johnson & Johnson of alleged chrysotile asbestos, they'll be yellow in parallel, right?
A. Well, no, it's not typical of this image 'cause it's not even close to -- the color is not even close to, you know, what we got. But

Page 63

yeah, you can -- what we see here is a little bit more darker, I would call it a darker yellow, that's -- that lighting on that almost gets that up to what talc is.
Q. Okay. Well, one of the things that we can -- we know is that talc in parallel typically is going to be about the same color as a talc plate, right, both yellow?
A. No, I guess you have to wait till redirect. You'll see that it's not.
Q. Well, one of the things we see on this image, you see a number of rounded structures, too, right? You can see them all over the field of view?
A. Yes, sir. Well, they're kind of round.
Q. And those are talc plates?
A. I agree.
Q. And there's no question that talc can appear, as I said, yellow in parallel orientation, correct?
A. At some shade, yes.
Q. And you were talking about, and you did it again a moment ago, talking about how this is darker gold than -- that's how you were

Page 64

characterizing the yellow, right?
A. Yeah, you've got the yellow, the darker yellow, goldish yellow.
Q. But --
A. A lot of people call yellow gold.
Q. But to be fair, this image that you're calling yellow gold was taken using a microscope that had a yellow gold orange light shining on the particle, right?
A. Yes, it had an incandescent lightbulb do that.
Q. And so, again, one of the things that -- if the colors are off because of this light, that light is shining on every particle here, right?
A. Yeah, I don't agree with the "if" but, yes, all those particles are being illuminated by the light source from the microscope.
Q. And this idea that you have to be careful when characterizing different shades of yellow as part of a PLM analysis, that's something that Dr. Su has written about, right?
A. I believe so.
Q. Okay. And you're familiar with him and you agree he's an authority in terms of mineral identification through staining techniques, correct?

Page 65

A. I used to.
Q. Okay. Used to. Okay. Well, that'll be interesting.
And let me see, you have agreed that he's a well-respected expert on PLM methods and analysis, right?
A. I totally agree with that.
Q. And you still agree with that then?
A. On regular asbestos-added products. I think the finding of the small chrysotile in these cosmetic talcs is a little bit different for him.
Q. You would expect every lab in the country to have Dr. Su's tables for PLM, right?
A. Yes, if he -- if he evaluated from the NVLAP, dropped them off, so he got to every lab.
Q. You include Dr. Su's tables as part of your reports in this case, right?
A. Yes, sir, I do.
Q. So, I want to look at something that one of his publications says about relying on shades of yellow, trying to characterize it as dark yellow, light yellow and the like. So, we'll make that D-5.
And so, I guess if we can just go to the front page of it.
All right. So, we're just going to

Page 66

have to look at the hard copy. Do you have a hard copy?
A. I don't have a hard copy, I don't think.
THE COURT: I'll give the witness mine.
THE WITNESS: All right. Thank you.
BY MR. DUBIN:
Q. Okay. So, one of the things that he wrote at page 12 of this document, just so we know what we're talking about, this is Determination of Refractive Indices of Asbestos Minerals by Dispersion Staining: How and Why, by Dr. Su from 2020, and you're familiar with this, right?
A. Yes, sir, I believe so.
Q. And one of the things that he says in here is that experience tells us that yellow is the hardest CSDS color to be quantified and should be avoided at all cost?
A. I'm sorry. Where are you reading that? What section?
Q. That's page 12.
A. That's why I'm not finding it on page 2.
Q. Okay. The same yellow CSDS color

Page 67

could be called golden yellow, yellow, light yellow, pale yellow, et cetera, by different analysts in the meantime is more susceptible to color temperature of light source and the type of daylight filter used than other CSDS colors, right?
A. That's what it states.
Q. So, in this method he's saying that making the kind of distinction saying, oh, well, I think this is more like chrysotile because it's golden yellow verse bright yellow is to be avoided at all cost because of some issues with potentially getting the shade correct, right?
A. No, none of that is in this. In fact, you're reading out of a section that says choose the right oil and avoid the 1.605 mistake when differentiating refractive indices of tremolite, actinolite and anthophyllite.
Q. But the impact of a color temperature of light is not specific to any particular mineral?
A. Our laboratory doesn't have any issue with that. So, that's what it says here is for amphiboles, not chrysotile.
Q. Okay. Well, we know that color temperature of light, that's influenced by using something like a Tungsten lightbulb, right?

Page 68

A. Yes, sir, it could. Unless you're a good enough analyst to overcome that by looking at standards, et cetera.
Q. Well, I want to look and compare 'cause we've already looked at USP and I want to look at -- so, that's true, right? Even if you use a Tungsten microscope, you can take steps to try to make sure that your image is appropriately illuminated and white balanced, right?
A. Correct.
Q. And MAS knows how to do that, right?
A. Correct.
Q. We'll get to that.
A. The Olympus, you had to white balance them yourself. The new ones, it's pretty much run by the computer system but you can tell when it's white balance.
Q. We'll look at that 'cause we can talk about white balancing, the concept. Basically what that means is, if we call up slide 27, white balancing what that means is, for example, let's assume on the left, I see a blue owl and I want to know is this some new species of owl that happens to be blue. One of the things I can say is I look in the background and I see a tree that should be green

Page 69

and it's blueish, too, right, and that's a clue that my image is off, correct?
A. Or your eyes.
Q. Or my eyes.
A. Yes.
Q. But it's clear my image is off. And that's why one of the things I've asked you about over time is what does the talc in your images look like? The talc in that scenario is the green leaves in the back and whether the talc is the correct color. Okay? And I'm going to talk to you a little bit about that. Okay?
So, for example, if we call up -- let's make this the next exhibit, CX 00006, it's an image we're going to look at a few times. (Handing.)
A. Thank you.
Q. And so, what I've marked is an excerpt from product number M70484, Linda Zimmerman analysis of Johnson & Johnson from February 24th, 2020. I want to call that image up.
So, let's look at slide 32. These are from pages 3 and 4.
And so, here we have an image of one of your first attempts to claim there was chrysotile

Page 70

in Johnson & Johnson. And so that we're clear what you're calling chrysotile here is that particle in the middle with the bar under it, right?
A. Correct.
Q. And these rounded structures around it that are the exact same color, those are talc plates, right?
A. Correct.
Q. Okay. And so, for example, if talc is generally brighter than that, right, in other words talc in general, just a talc plate is generally brighter, that's a clue for us that the colors are off on the image, right?
A. Well, that image is not what we have here but you're saying this is brighter or --
Q. I'm just saying that, so, you're characterizing your particles as dark orange or what are you characterizing that color of that particle you're claiming is chrysotile?
A. Well, I wouldn't look at that. I would say that is a yellow with some gold and then some of the talc plates, some of the edges, the edges of the plates are disperse -- are causing a dispersion at a higher, a more brighter yellow. So, I don't see anything wrong with that.

Page 71

Q. I just want to compare it to some other images that we've seen also from Vermont talc. This is Vermont talc. We'll look at another image of Vermont talc from a different lab.
A. You're only leaving half the story out. You don't have --
Q. Well --
A. Excuse me. You don't have a perpendicular in here, which if you were to look slightly down to the left, down from the particle to the left, you see a fibrous material that's got blue to it. So, if you show the perpendicular, most everything you see in there will stay the same color. And then, of course, the chrysotile portion will be the blue.
Q. We're going to -- I'm sorry, we're going to look at perpendicular also but you're saying that that parallel is going to change blue?
A. What's going to change -- when it goes to perpendicular, it's going to change color.
Q. Well, so does talc, right, talc also changes blue in perpendicular?
A. Not talc plates, fibrous talc does.
Q. Okay.
A. Or the edges of talc plates where

Page 72

you've got them stacked up or you're getting some dispersion there, multiple layers, that gives you more of a fibrous talc color.
Q. But you're calling this chrysotile fiber, right?
A. A bundle. You don't see fibers.
Q. So, if it's talc, it would also be in a fibrous shape, right?
A. If it is talc, then you look at the birefringence and the birefringence for this is not going to be even close to talc.
Q. Let's not get ahead of ourselves. First let's look at another image from a different lab, from Dr. Sanchez' lab, and I'll mark this next as DX-2111 -- I'm sorry, I'm sorry, D-7. Ignore the other number.
THE COURT: We'll take a break after this.
THE WITNESS: Thank you, Your Honor. I was just going to ask.
BY MR. DUBIN:
Q. Trust me, we're going to get to all the stuff. We're just doing it piece by piece first.
So, this slide is going to be from

Page 73

page 12 of the document. If we could call up slide 33.
So do you recognize this as an image of Vermont talc, Johnson & Johnson Vermont talc, taken by Dr. Sanchez' lab?
A. No.
Q. Okay.
A. I don't recall seeing it but is this -- okay. It's in 1.552 oil, not 1.550.
Q. You can look at page 12.
A. Page 12.
Q. You see that the image is a lot brighter first, right?
A. A lot brighter?
Q. The illumination, the ability to see the particles.
A. Than this other one?
Q. Between yours and his and maybe it's helpful to just put them up at the same time, slide 34.
A. If you're suggesting we don't have the brightness all the way up, you are just dead wrong. I know that's part of what you all think but that's just not true.
Q. We're going to get to that. Why

Page 74

don't you tell me are you swearing under oath that your imaging, when you do it, the illumination is a hundred percent?

A. No, it's a hundred percent for some folks. Some folks might turn it back to 97, 95 because it's too bright. But to say that we don't put enough -- that we're not imaging it correctly is just dead wrong.

Q. We haven't even gotten to illumination yet. We're going to do that, trust me.

A. I'm sorry. I thought you were getting to it because --

Q. I am. But do you see just visually that one image is much brighter and you can see more of the particles in the background than the other?

A. You know why that is?

Q. Why? Go ahead.

A. Because we're looking at those big particles. So, you have the big particles at this plain. You want to be up here. If you were to move it down to get all the other ones, they would be brighter but you have taken them out of focal range.

Q. Well, another thing we see is that we don't see the kind of golden yellow color that we see in your images that were taken with the Tungsten

Page 75

lightbulb, right?

A. You can't really say that unless it's different here because we were using 1.550 refractive indices and this says 1.552, temperature corrected oil.

Q. We'll talk about what effect that should have and whether that is an excuse when we get to changing oils. But do you at least agree with me that the one that does not have the Tungsten lightbulb shining on it is giving you different colors?

A. If that is an LED, then I would expect that. But you're also going to get a different color, even though you're going to get the same refractive indices, when you change the refractive indices oil, I understand.

Q. Right, but we'll talk about this, but when you change the refractive index oil, you should be pushing the color, for example, the color of the parallel towards blue and towards magenta, right? When you raise the refractive index oil?

A. No, mostly blue.

Q. Okay. And --

A. Blue in parallel direction. If it's at a certain range on the refractive indices.

Page 76

Q. Changing the refractive index oil is not going to make a yellow brighter, right?

A. No. Changing the -- it depends on which way you're going.

Q. Right. If you're raising your refractive index oil and this one is higher than his, changing it to raise the refractive index oil is not going to make a yellow particle brighter yellow, right?

A. I agree.

Q. Right? It's going to push it towards the magenta or blue range, correct?

A. Yes.

Q. And so, if I maybe indulge one more slide just because it's related to that point or if not, I can break and bring it back.

THE COURT: We're going to break.

MR. DUBIN: Okay. Thank you, Your Honor.

THE COURT: 15-minute break everyone. We'll be back at 10 of. Thank you. We're off the record.

(Recess: 10:34 a.m. to 10:58 p.m., Eastern Standard Time.)

(DERELL WILSON, ESQ., EARLY, LUCARELLI, SWEENEY & MEISENKOTHEN APPEARING.)

Page 77

THE COURT: Mr. Dubin, thank you for your patience.

MR. DUBIN: No problem.

I just want to back up and show a few of the slides I've already shown. We're going to discuss a lot more why this is important but I just want to go back over two of them quickly.

BY MR. DUBIN:

Q. If we go to slide 20 and I'm just going to have to trust things are up there. If we go to slide 20, you'll see there's a basic birefringence formula that you use, which is parallel RI, perpendicular RI equals birefringence, right?

A. Yes, sir. If there is a range on one of the bundles, we would use that.

Q. And just if we look at slide, I think it was 18, we walked through this, that the analyst sees a color, is supposed to pick the correct color on the color chart, that results in a wavelength of light and that results in a refractive index, right?

A. Yes.

Q. So, fundamentally, what I am talking about, for example, is when we're talking about

Page 78

yellows, for example there's a different refractive index associated with a golden or orangey yellow than there would be with a bright yellow, right?
A. Yes.
Q. And similarly, when we talk about blues, there's a different refractive index associated with brighter blue as opposed to darker blue, right?
A. That is correct.
Q. So, when, for example, we're talking about how golden or yellow your images are in parallel, that will determine which wavelength of light you're picking and, therefore, which refractive index number goes into your birefringence calculation, right?
A. Correct.
Q. Okay. So, with that in mind let me go back and we'll do some examples later about why it matters but I just want to return, I think it was probably slide 34 last.
And so, what we were looking at here is just an image of talc taken in Dr. Sanchez's lab versus an image of Vermont talc taken in your lab using PLM, right?
A. Yes, sir. The one on the right

Page 79

that's correct.
Q. And I was remarking on the difference --
A. Wait a minute. The stuff on the right, report on Chinese.
Q. I'm sorry.
A. Not Vermont.
Q. I'm sorry, there was an earlier comparison. I can't tell what's up there. There are two different comparison slides, 32 is the one comparing it to Zimmerman. Is that what you're looking at now?
A. That's what I'm looking at now.
Q. I have just another example that I put up there. But so what I was remarking on is the difference in the kind of colors of yellow that you're seeing and also the illumination of the image, and that's what we were discussing when we left, last left off, right?
A. Yes.
Q. Okay. And so, next, instead of comparing the image that you're working off of with these golden, golden yellows and those are the images being taken with a Tungsten lightbulb shining on the particles, right?

Page 80

A. Right. And just to be clear, it's a white light that has a little bit of yellow shade to it. It's not a yellow lightbulb.
Q. You described it as casting a yellow golden orangish hue, right?
A. Correct. But I want to make it clear, it is not a yellow goldish orangish hue lightbulb. It's a white lightbulb that has that frequency -- I mean wavelength.
Q. One of the things we're going to be talking about later, but I just want to show a quick image of it now, is at some point you change your microscope, you change your light source, and you change your refractive index oil, right?
A. Not all at the same time.
Q. Not all at the same time. But by the time we get to Valadez, which we're going to be talking about, those have changed, right?
A. Correct.
Q. So, I just want to compare quickly to an image of Valadez that we're going to be talking about later. So, I'll mark as the next exhibit D-8 from MAS project M71614. We're going to refer to as the Valadez analysis. And I just want to look at a picture once we've taken the Tungsten lightbulb out

Page 81

of the equation in your lab. Okay?
So the image from the Valadez or post Valadez is going to be from page 3 of the major report. So, let's call that up as slide 35.
And so, one of the things we can see here is so the image on the right, you have no longer using a Tungsten lightbulb, right?
A. Correct.
Q. And we can see, so, for example, in the middle and we'll talk about that particle, that's what you're calling chrysotile in the Johnson & Johnson, right?
A. Correct.
Q. But we can see that when we've removed the Tungsten lightbulb from the equation, the colors, yellow colors are much brighter for the talc, right?
A. That would have an effect but we're also using 1.560, which it takes -- brings the wavelength out of the yellow gold range.
Q. Well, we'll talk about that because actually, as we just mentioned, we were talking about this a second ago, we'll go through why, changing the refractive index oil by raising it should actually make the particles less bright

Page 82

yellow, not more bright yellow, right?
A. Going to 1.560 will make it less yellow.
Q. Okay. So, when you say, oh, it's not just the absence of the Tungsten light, it's the oil here that's changed, the oil should be having the opposite effect. It should be making yellows move towards the orange or magenta, right?
A. No.
Q. We'll do that in a second because we're not done yet with the work before you change the bulb.
So, the next thing I want to talk about about your older images is some criticism that was made of your work by Dr. Su about the illumination of your images and the impact that that has on the colors that the analyst is reporting, and that go into your ultimate calculation.
And so, I'm going to mark next as D-9 an affidavit that you've seen from Dr. Su about your work. This is something we can call up.
(Handing.)
A. Thank you.
MR. BRALY: Mr. Dubin.
MR. DUBIN: Sorry, forgot.

Page 83

BY MR. DUBIN:
Q. And so, if we can call that up, please.
So, and if we can go to the next page.
So Dr. Su, that's the same Dr. Su who's in court today, back in 2022 wrote this review of your analysis, this is of Gold Bond medicated powder, and it's entitled Talc Misidentified as Chrysotile, correct?
A. That is correct.
Q. And somebody gave this to you around the time, back in 2022, correct?
A. Yeah, I think Dr. Gunter produced it in one of his reports and it made the rounds after that happened.
Q. And one of the things you first tried to do in response was to claim that Dr. Su didn't really write the report, correct?
A. I didn't think he did.
Q. You --
A. I was obviously wrong.
Q. You went so far as to accuse a defense expert, Dr. Mickey Gunter, of writing the report instead of Dr. Su, right?

Page 84

A. I didn't -- I said I thought he might. I didn't have any -- as I said, I didn't have any evidence that he did.
Q. And you said while you have respect for Dr. Su, without him testifying under oath to explain his opinions, you didn't know what to make of them, right?
A. That is correct.
Q. And when you said that, you knew he didn't live in the United States, right?
A. Of course.
Q. Okay. And at some point Dr. Su did actually come to the United States to visit his daughter, and while he was here he signed the report and made a little video to show you to prove that he did, in fact, write it, correct?
A. Him and Mickey Gunter. I think we've all seen it.
Q. And I think at this point you've agreed you have to basis to dispute that Dr. Su, who is right here any way, did write this report, correct?
A. I was wrong.
Q. Okay. And one of the things that you said was that if you ever saw Dr. Su at a

Page 85

conference, you would try to go and talk to him about it and understand the basis for what he had said, right?
A. That's correct.
Q. And you were both recently at the ASTM Beard Conference in Philadelphia, right?
MR. BRALY: Your Honor, at this point we're straying well outside of just methodology. This is actually a separate issue that I didn't think we were going to get into today that we should probably talk about at sidebar, if we can.
THE COURT: All right. Sidebar.
MR. DUBIN: I'm not going to ask the final question, if that's what you're asking.
MR. BRALY: All right. If we don't need to talk about it, we don't need to talk about it.
MR. DUBIN: I don't think so based on --
THE COURT: You're all speaking a different language. It's totally unclear to me. I don't how relevant it is to this 104 hearing, but let's bring it back to the 104 and maybe at some point in time I'll understand what we're doing.
BY MR. DUBIN:

Page 86

Q. Well, you and Dr. Su were at a conference and you didn't go and talk to him, right?
A. I never saw Dr. Su. I never knew he was there. So, yeah, if I saw Dr. Su, I would have asked him about it.
Q. And one of the things that you have criticized in Dr. Su's report is the idea that he manipulated your images or Photoshopped your images is one of the things you've said, right?
A. Yes, sir.
Q. And so, I want to look at those images and what he did and what his point was and then we'll talk about how it applies to your work. But first I just want to understand on a very basic level how illumination can impact color which then goes into your analysis by which you call the stuff you're finding chrysotile.
And so, let's just start first with slide 37 and I made these. I can't see how they look. So, I just took, I went and found some flowers on Amazon, if anybody likes them, you can -- I think it's 14.99 for Forget-Me-Nots, and blew up a little bit of the image of some of the flowers that are on the Amazon site.
And then if we go to slide 38, I just

Page 87

turned down the brightness a little bit on this and what we can see is that by reducing brightness on an image like this, you can start to turn lighter blues into darker blues and those would have, those two colors would have different refractive indices, right?
A. Yes.
Q. And you can also start yellows as it gets darker turning into or even if they were bright yellow, you can start seeing them turn into darker orange, right, for example the center of the flower on the bottom, right?
A. That's correct.
Q. And so, if we look at what Dr. Su was saying about your imaging and its effect on color and the effect on the analysis, we can go to page 6 or page 7 unless I have slides. Is that visible to everyone?
So one of the things that Dr. Su was pointing out is that in his view, you did not have appropriate or normal illumination of your images, right?
A. Well, that's -- you're right that's what he stated. He's wrong. I don't understand how he can make that decision in China when we're over

Page 88

in the United States never looking at the operative microscope. So, I just totally disagree what was going on here.
Q. Okay. So, the failing is that he doesn't have an opportunity to observe it through your microscope in your view, right?
A. We have never done anything but have it on full brightness.
Q. One of the things he did is he raised the illumination and the image and now, for example, and, again, these are the Gold Bond, we'll look at some J&J, but now, the yellows are brighter in parallel, right, and that's a typical color for talc in parallel, that brighter yellow, right?
A. I would agree.
Q. Okay. And the other thing that he talks about on the next page, page 7, is that just by raising the illumination to what he thought was an appropriate level, the dark blue particle that you're reporting on became a light blue particle in the illuminated image, correct?
A. That is correct.
Q. Okay.
A. You can do all kinds of stuff with Photoshop.

Page 89

Q. Well, again, so you're not saying that anything has been changed except for brightness level here, right?
A. That's a lot. You're taking evidence and you're molding it into what you want to see.
Q. Well, what he's pointing out is that in his view, this is what in normal illumination, what you should be seeing under the PLM, the brighter images, right?
A. Well, you keep saying "right." That's his opinion but you can't -- at least I always thought you can't take evidence and change it and say, gee, this is what it would have looked like if they did this with absolutely no evidence whatsoever that that's true.
Q. We're going to do the same thing with some other images in a second, but before we get there, let's show some evidence that it is true.
Okay. So, as we pointed out, you started looking at Johnson & Johnson for chrysotile in about, what, 2019 or late 2019 or early 2020?
A. Sometime in 2020.
Q. And your first report was the Zimmerman report, which we've already marked and looked at, right?

Page 90

A. I guess so.
Q. And so, we've seen that image before already. I wonder if we can call it -- it's CX-006.
So we were talking about this and I asked you about the illumination on this image and the dark golden colors on this image, right? You recall that?
A. Yes.
Q. And I said there are ways that you can use this type of microscope but white balance or purple illuminate your image to get what should be an appropriate PLM image for dispersion staining, and there are ways you can do that, right?
A. The illumination is controlled by just a small little wheel. These PLM analysts would not want to cut all that down because it would make it harder to see all the structures.
Q. So --
A. What you ought to show here is the talc under the same conditions as this, that's completely different.
Q. Okay. So, let's do that.
So now I'm handing up -- we'll mark this as D-10 -- a declaration that you had in an image that was taken in your lab at around the same

Page 91

time of the image we just saw, the Zimmerman image, that wasn't when you were looking for chrysotile in Johnson & Johnson. That's D-10.
All right. And so, what we understand -- so we understand what we're about to be looking at, this is an analysis that was done in early 2020 around the same time as the Zimmerman analysis out of your lab looking at a product with RTV talc in it, right, assessing what asbestos is there, right?
A. That's the famous apron. Okay.
Q. That's correct, right?
A. Yes.
Q. Okay. And you were using the same type of analysis at least in what we're going to be showing here, the PLM dispersion staining analysis, to look at whether there's chrysotile there, right, 1.550 oil?
A. No. We were just after to show there was fibrous talc. It had nothing to do with chrysotile.
Q. You're doing --
A. Excuse me. This was all for fibrous talc.
Q. Okay.

Page 92

A. There's never been -- I've never seen any data that suggests it's in there but we haven't looked at it using the new methods.
Q. Well, you're doing the same analysis. You're looking at the talc with dispersion staining analysis in 1.550 refractive index oil, the same way you were doing that for the Johnson & Johnson talc samples, right?
A. That is -- excuse me -- that is correct.
Q. So now I just want to look -- we can put the image up verse the Zimmerman image, that will be slide 39.
So, on the left, this is an analysis of RTV and on the right this is an analysis where you're claiming to find chrysotile in Johnson & Johnson, right?
A. That is correct.
Q. And so, as we pointed out before, one of the things that Dr. Su criticized was the brightness of your illumination and the color of your talc, right?
A. No, he was criticizing not the color, just that it was not -- in his mind we hadn't turned up the illumination.

Page 93

Q. And we can see that the illumination, when you weren't trying to claim there was talc in -- I'm sorry, chrysotile in Johnson & Johnson, the illumination of the Vanderbilt image is significantly higher than the image that you present when claiming there's chrysotile in Johnson & Johnson, right?
A. I'm sorry, could you repeat that.
Q. Sure.
The image, when you were just looking at RTV, is significantly brighter than the image of when you were trying to claim there is chrysotile in Johnson & Johnson, correct?
A. You're looking at a whole different population of the types of talcs and stuff. No, I'm sorry, it's -- you're cherry-picking all these things on different types of samples. We do not reduce the brightness.
Q. So then why is one image so much brighter than the other even though we can see if we look at the analysis dates, they're done very close in time together by the exact same analyst?
A. Different mine, different properties.
Q. Well, so, you're now telling me that the different mine, if I put talc from one mine

Page 94

under a microscope, I put talc from another mine under the microscope, that is going to turn the illumination up on one of the mine sources. Is that what your testimony is under oath?

MR. BRALY: Your Honor, I do appreciate that 104 hearings lack standards of evidence but this is argumentative at this point. I appreciate if we can make an objection as to argumentative.

THE COURT: I'm going to overrule that objection. It is a fair question.

You can answer that, please, Dr. Longo.

A. One is an industrial talc source. All the rest are the cosmetic talc sources. You've got size, you've got other materials in there. That's the only -- that would be the explanation on this -- wait a minute.

When was this done? 1/9/2020. And the Zimmerman was in February of 2020. I don't believe we had the new scopes yet.

Q. Right, same scope --

A. No. It's not the same scope. This one over here I believe is the new, would be the new one that's much later on in the year. I'll have to

Page 95

research that.

Q. Okay. We can see that in the analysis dates on them how close they are. The analysis dates were even closer than the report dates.

A. We'll have to take a look at that because we have a different one, so, a different mine.

Q. Okay.

A. I'm still disagreeing with you on this.

Q. Right. And you've taken the position essentially that Dr. Su, when he has raised the illumination on your images, is engaging in what you call, make believe, right?

A. That's his opinion. He believes it, but he's wrong.

Q. And the one way we could certainly know that is by looking down the scope, at your microscope, right?

A. To know that we have it on high brightness?

Q. We could know whether you have appropriate illumination by looking down your microscope and seeing it?

Page 96

A. No, I mean, I'm not going to have you come in our lab and do that.

What we'll be able to see it is when we have to chance to show not these cherry-picked ones but when we are comparing the SG-210, when we show a chrysotile, half chrysotile, half talc structure with the same kind of conditions and they're completely different.

Q. Right. All right. And I just want to make sure that we understand ourselves here because you're aware Dr. Su has a master's degree in mineralogy; did you know that?

A. He's very highly qualified.

Q. He studied under Dr. Bloss, who's a leading figure in PLM analysis, right?

A. I don't know that for a fact.

Q. Did you know he did two years of post doctoral research on PLM analysis?

A. Yes.

Q. Did you know he's performed over a thousand on-site evaluations of TEM -- for TEM and PLM accreditation?

A. Yes, sir. I think the last time he was at our lab was 2015, according to Dr. Su.

Q. He has more than two dozen

Page 97

publications on asbestos analysis, many of which focus on PLM, right?

A. That's correct.

Q. And you've never taken a single PLM class?

A. I haven't.

Q. And you think that -- you think you're more qualified to comment on what appropriate illumination is in a PLM microscope than he is?

A. I am more qualified to talk about what our microscopes do, what our analysts do, versus somebody that's 3,000 miles away giving an opinion.

Q. He's not 3,000 miles away right now, right?

A. Well, I guess he is closer now to the microscope. So, does that make a difference, even though he's not seeing anything? It's not the kind of data that I would ever present.

Q. So, you and I both agree then that it would be better for him to actually be able to look through the microscope?

MR. BRALY: Your Honor, there --

A. No, it's not.

MR. BRALY: There is a fundamental --

Page 98

there is a separate motion that he is trying to develop evidence for in this hearing, which is inappropriate for what this is supposed to be.

We're no longer talking about methodology. All we're talking about are cross points and differences of opinions.

So, I object to this line of questioning and would like to return to a discussion about methodology.

MR. DUBIN: Your Honor, that's fine. I won't argue, Your Honor. Whatever you say.

THE COURT: I'm going to sustain that objection.

BY MR. DUBIN:

Q. Okay. So, let's then -- I just want to talk about the lighting again, because the illuminated images that Dr. Su had worked for Johnson & Johnson, I'm going to talk about lighting both in the pre Valadez images and the post Valadez images.

Let me return -- so we understand again why this is important and we'll keep wrapping it up multiple times. We'll go back to, was it slide 21, the birefringence slide?

So, I think we've already mentioned

Page 99

that the classic colors in parallel and perpendicular for talc are yellow in parallel and blue in perpendicular, right?

A. That is for the 1866b standard, you're correct.

Q. Okay.

A. In 1.550.

Q. I was talking about the talc, not the chrysotile yet.

A. Oh. In 1.550. You will have that in 1.560, not quite as bright but you get that.

Q. And so, we made some slides of images, and we'll attach all these as copies later, but just to see what would happen if we raise the brightness on some of your images, and we'll talk about that later, but if we could go to, for example, slide 41. We'll just do a series of them.

So, for example, on the left we have your image, right, and you see a dark blue particle and that would result in a specific refractive index based on the analyst calling it a dark blue particle, right?

A. Correct.

Q. But if we illuminate the image a little bit more, we see a bright blue particle which

Page 100

is the classic color of talc in perpendicular, correct?

A. It would be close but is this computer-generated? I mean, how are you guys doing this?

Q. I'll tell you how we did. We're going to show how we did it with a later witness, but we just took the image, put it into PowerPoint, and it raised the illumination, period, no change in color, just raised the illumination.

A. So it is Photoshopped.

Q. Correct. That's what I'm pointing out to you, is you raise the illumination changing it into the regular talc color.

And so if we do another example, for example, 42, we have sort of an image on the left of a darker blue particle and then when you raise the illumination, you start to get the brighter yellows and the brighter blues that are typical of elongated talc, right?

A. No. That one's not bright enough for it to be talc. You needed to turn that up some more.

Q. Well, I mean, the color, the one that you're saying is chrysotile is the one with the

Page 101

arrow, so that's a blue, so that's a brighter blue, right?

A. I can see the lightbulb over it but that blue is not enough intensity that I would have called that, I don't think, talc. You just need to raise it up more, raise the voltage up more.

Q. We'll talk about later how all of that impacts your birefringence calculation that you're relying on, the color of it claimed to be being observed, verse what color we believe was actually there.

But before we do that, and we get into more about the calculation, I want to move to your Valadez work because I think it'll help us understand what we've been seeing here.

So, let's go back first to slide 35. And so now we have images, these are both from your laboratory, right?

A. Yes.

Q. And they're both of alleged chrysotile in Johnson & Johnson talc or talc source, right?

A. Yes, these are chrysotile bundles.

Q. Okay. And we can see that when you change again on the right, now you've got an LED

Page 102

light and you've got a new oil and a new microscope, right?
A. Correct.
Q. And all of the very deep gold from your old images is -- it's mostly gone, you now see some more yellows, and these lighter blues, when you change the microscope and light, right?
A. You change the microscope, you change the oil, so, you're going to get that blue effect there and you have LED lights.
Q. And to make sure we understand a little bit about what the switch the oil does and, again, you raised the oil so it went from 1.550 up to 1.560, right?
A. Yes.
Q. And so, we'll just call up a slide just to help us understand what that should do, because -- let's just call up 31, just as an example.
So this is one of your older images, right?
A. Yes.
Q. And for this particle we're going to talk more about what this does.
But you'll see, you write there

Page 103

RI1556 to 1569, right?
A. Correct.
Q. And that's a piece of data that you get after you observe the color, change it, to figure out where it is on a color bar, and then transfer that into a refractive index, right?
A. Correct.
Q. And so, we'll talk more about this later, but the way -- there are two different ways you deal with birefringence when you have a range, one of them is just taking the average, right?
A. Yes.
Q. And so if we took the average here, you were treating this particle for purposes of your analysis as if it has a refractive index of about 1.562 or 1.563 or this kind of red to magenta color, right? That's what your input is?
A. Red to magenta color? What are you talking about?
Q. 1.562, what would you call that? What color would you call that?
A. 1.562?
Q. Yeah.
A. Getting in the oranges. You've got 1.569, 1.556. Did you average it? Is that 1.562?

Page 104

Q. It's 1.562.5, so it's either 1.562 or 3.
A. If you average it, that's what you get. 500, that's close to that, but you have to take in account that, you know, it's two levels. That's why when we did this one, we broke it out, I'm imagining.
Q. But the input for your calculation, when we're trying to figure out, okay, what's the birefringence value, is Dr. Longo going to say this is chrysotile, the input from that is approximately 1.562 if we back it out of your analysis, right?
A. Well, you know, slow down. We have to look at the perpendicular to see what the alphas were, so that we would take the high parallel, subtract out the high alpha, the low, and that will give the range and then average that.
Q. Right.
The input for the parallel is based on calling this particle that color that's blacked in, right?
A. It's -- you've got the brighter side, the 1.569 as you go round it, and then you have the lower side where you are getting more of the goldish red. So, at 1.69, you know, we're up in the 440

Page 105

range. So that's how we've done these in the past.
Q. Your reported refractive index is the number that goes into the birefringence calculation, right?
A. Yes. You would take the 1.569 subtract out the high gamma and the 1.556 and subtract out the high gamma -- excuse me -- the low gamma.
Q. Okay. So that's what you're saying you're doing now, you're --
A. We've always --
Q. We'll get to that.
A. We've done that for a while.
Q. We'll get to that in a little bit, but all I want to point out is what it means to change oil before we get to what you're calling your particles, and that's where we're going to get you calling yellow particles purple. But let's just focus right now on the effect of the oil.
If I change the oil -- and you did this in response to a criticism that Dr. Su made in his affidavit, right?
A. Well, a couple people. Dr. Jim Weber said we ought to use 1.560. I think Sanchez said the same thing. I think Segrave said the same

Page 106

thing. And Dr. Su said use 1.560 in his 2022 paper if you're in the ranges, that 1.560, and he said if you're doing it for legal work, it's more precise. So that's why between him and Jim -- and Dr. Weber, that's why we changed.

Q. And so we understand, so, let's say we have a particular and it's in 1.550 oil and it's showing as, let's say, one of these dark golden yellows, which is a lot of what you are characterizing the particles as before, right, so we'll start there. Okay?

Changing the oil to raise it should push the particle color to the right, so, in other words, it should push orange towards the magenta towards the blue, right?

A. I agree.

Q. Okay.

A. I thought that's what I said earlier.

Q. But you should not, if you change -- if you raise the oil and your color calls were correct before, you shouldn't be moving in the opposite direction; you should not be having a particle that was orange before, you raise the oil and now it moves to the left; it doesn't get brighter yellow, right?

Page 107

A. Using 1.560 doesn't go to the left; it goes to the right.

Q. Right; it goes to the right.

A. Yeah.

Q. But then if we look again at your images, slide 35, after you change your oil, all of these things that were golden, you know, the talc that was golden before or orange before, it doesn't move to the right, it gets brighter, the exact opposite of what you would expect if your particles were really golden or orange to begin with?

A. Doesn't get brighter. Are we looking at the same thing?

Q. The yellows, you don't think those are a brighter scale on the color bar of those yellows than the orange that we're looking at on the left?

A. On the pre Valadez is on the left and that's bright, you got goldens, you got yellows. And then on the post we have, you know, a lower -- it's not -- it's not shifting -- it's not shifting to the left.

Q. Let's go back to the slide we just looked at before, the last one.

We just talked about this. So, if

Page 108

you have something that's gold orange here -- orange here, the color when you change the refractive index oil should move to the right, it should not go back to the left where you have brighter yellows, right?

A. It's not going back to the left and you have to understand, you've got a chart here that's for 1.550. You have to use a different chart for the 1.560, right?

Q. No, that doesn't matter for the color bar itself, it doesn't matter which way the colors move on the spectrum of light.

A. No, I agree with that, but to get -- it's not brighter.

Q. Okay. So --

A. You're saying the stuff on the right is brighter than stuff on the left?

Q. If we go to 35 again. So, you don't think that the yellows that we are seeing on the right are further to the left on the color spectrum than the orangish colors that we're seeing in the left image; you're denying that?

A. I'm not denying it. It's just not right.

Q. Okay. Let's also now talk about, we're going walk through there are four particles in

Page 109

Valadez that you called chrysotile and we'll walk through quickly each of them and talk about what color you called it for purposes of your analysis and how that impacted whether you're claiming it's chrysotile.

So as we pointed out before, just to make sure we're backing up enough each time, slide 16, the process starts with the analyst picking the correct color, right?

A. Right.

Q. Okay. And this particle, that's the ISO reference and it is considered to be, if you back out the calculation, a magenta, right?

A. Right.

Q. Now I want to start looking at what you did when you were picking colors to call things chrysotile. And so, slide 35.

A. That's the same slide.

Q. Well, then it's got to be slide 45.

A. Okay.

Q. Double-sided printed it so --

A. That's the same slide.

Q. This is going to be the first image that we're going to talk about of your alleged chrysotile in the Valadez report.

Page 110

And, again, so, the key thing is what does the analyst actually see here as opposed to what does he report the color is. Okay?

And so if we just go to the plain image, I guess let's make it an exhibit next. It's already an exhibit.

Let's just go to the plain image first, and it's PDF 3, it's something that's already in evidence, which is the 2023/02/28 Valadez report.

What D number?

MR. HYNES: Eight.

MR. DUBIN: D-8, okay.

BY MR. DUBIN:

Q. Let's put just the image itself up first. Is there a way we can Zoom on that a little bit to make it easier to see?

Okay. And so, when I first asked you about this without using a color bar or without doing anything else, you told me that you were observing in this particle a brownish gold, correct?

A. Correct.

Q. Okay. But then you give some data here -- if we can scroll back up, we can see RIs. You give some data at the bottom and there's an RI number. You see it? You see RI 1564, right?

Page 111

A. Correct.

Q. And what you're able to do when you give us that piece of data is we can do an analysis in reverse to figure out what color your analyst was calling the particle. And so I just want to make sure we understand how that works in reverse. So let's start with slide 46. Actually, we can probably go to 47.

Okay. And so, for example, if you just give the RI which was 1564, we can consult the Su tables for the appropriate oil, and if we go to 4 -- I can't see -- if we go to 48, we've done this before, we can see that the color you're calling this is equivalent to the wavelength of light of 560, and if we go to slide 50, we can see that that color, the color that you are calling this particle for purposes of your analysis calling it chrysotile is this deeper purple, right?

A. It shows it on there but it's a blend. So that's where that should be -- should be in my opinion. There really is no purples I'm aware of. But that's where it falls. And I stick with it.

Q. And you stick with it because you've already admitted that if we go to, for example,

Page 112

slide 51 you have admitted that for purposes of your analysis calling this chrysotile, you have treated this particle in your analysis as if it is the circle color here, 1.564, right?

A. Yes.

Q. Okay. And I think we already -- you already agreed with me about what color reference chrysotile is on the wavelength, right, and that's a color corresponding to magenta, correct?

A. I haven't agreed with you --

Q. Do you agree --

A. -- other than it's an 1866b standard. You don't get magenta when you look at other -- what people say are chrysotile, such as the SG-210 or the RG144 at the smaller sizes, but for asbestos-added products I totally agree.

Q. I'm just asking what color it is. Let's do it more slowly then. Let's go back to slide 15.

And ISO gives refractive index values for these reference samples, right?

A. That's correct.

Q. And do you recall what the reference number is in parallel?

A. I do not.

Page 113

Q. I mean, we can just -- we've already marked ISO but do you recall it as 1.556. Otherwise, we can look back at ISO.

A. Okay.

Q. What?

A. I said okay.

Q. So, this is slide 19, we'll just call it up. It's already in. So they're reference values. So, ISO tells you what color it thinks that is, right?

A. Yes, for the 1866b.

Q. And so, it gives you this number 1.556, right, correct?

A. Correct.

Q. And if we look back at Longo slide 15, you can see that 1.556 corresponds to this magenta, right?

A. Yes, sort of magenta, I agree.

Q. And so, just comparing the two colors that you're calling this -- we can go to slide 54 -- you are claiming that this particle that you found in Johnson & Johnson that's on the left is more purple than standard reference chrysotile, right?

A. No, it's not more purple. It's just

Page 114

a blend of those colors. And you have to be looking under the microscope also to dial it in, but it's not magenta and has no relationship to these 1866bs.
Q. And, remember when we were talking before that one of the reasons why chrysotile has a low birefringence value, for example, is that purple is not that far from blue on the color chart, right; that's why chrysotile has a low birefringence, right?
A. It has a low birefringence because that's the way the crystal is designed.
Q. But if I'm looking at a yellow particle and I treat it as a purple particle, then I'm creating low birefringence?
A. No, we're not creating anything.
Q. Well, there's no dispute, though, for example, if we look at slide 55, that when you do this calculation, when you eventually do the birefringence calculation that you rely on, the input in one of the two numbers that you're using for that calculation for this particle will be based on the refractive index that's associated with that dark purple, right?
A. That brownish color, yes.
Q. Okay. And so whatever result you get

Page 115

in your birefringence calculation, it's going to be based on calling that particle purple?
A. We're not calling it purple. It's got a tint to it and you have to -- you have to know that the way these colors work on these crystals, you don't get exactly what those charts ever show. It's a blend, so I stick with it.
Q. And so, let's do some of the other particles. We can just do it more quickly. We can go to Longo slide 56.
This is your second particle or CSM 002 and, again, before I showed it to you on a color bar, you told me that it looked brownish gold, right?
A. Now that I'm looking close, I see some purple on the outer edge.
Q. But you also agree that the color that you're treating this for, so your refractive index you're giving us is 1.565 and if we back that out, the color that your analyst is calling this is somewhere between that 1.564 purple and the 1.566 magenta, right?
A. No, you have to -- it's hard to see it here, especially, you know, when you're reproducing it. But if you go to the outer edge

Page 116

that we looked at, that has the purplish color in it.
Q. Okay. And the next particle was 003. And if we look at that on a color chart, that's slide 57, so this is something you're calling chrysotile in your Valadez report, right?
A. Correct.
Q. And you're treating this in your analysis as if it is the circled color, 1.568, which is magenta, right?
A. If you look around the outer edge, that fibers there, that's what is being seen.
Q. Okay. But functionally you're basically saying that all of these particles in parallel match standard reference chrysotile?
A. No, I'm not saying that at all.
Q. You are treating them as the same color or more purple?
A. We're treating them that what it shows. Where if you're just taking the outer edge or the one where it's being, you know, refracted through the outer edge, then -- we started doing this after Dr. Bo Li was in our lab doing our last NVLAP and we were showing him this materials to look at and he said we should use the very, very last,

Page 117

you know, the very edge, fiber bundle, fibers on edge. But I'm not sitting at the microscope and this has been copied a few times, so it's kind of hard to debate you on it.
Q. Okay. So, slide 58, just so we can get the last particle, this is another particle that you're saying has a refractive index range of 1.565 to 1.568, so the circled range, again, treating this particle for your analysis as if it's magenta, right?
A. I wouldn't call it quite magenta, I'd call it more purple.
Q. And, I know one of the things that you've -- and you've mentioned it here, if we go back to slide 51 for a second, one of the things that you said and you tried to say is, well, sure, looks yellow, but I see some coloration around the edge and you said that again today, right?
A. Yes, sir.
Q. But, even if we look at just this one image and we can look at a lot more if we need to, there are things around this that are definitely talc plates, right? You're not claiming that's all chrysotile, these rounded structures, right?
A. No, of course not.

Page 118

Q. And so, we see the same kind of red edge effect because of your imaging on the talc plates also, right?
A. We have to get it in the same orientation but some do, some don't.
Q. And I asked you about that initially before you started relying on the edge effects to call fibers chrysotile, I asked you about these edge effects and you told me that when you see them on particles, you don't know whether they were just an artifact or not, correct?
A. When was that?
Q. That was in your Eagles deposition.
A. Then that must be correct.
Q. Okay. And I asked you whether these red edges were an artifact and you said maybe, and you would have to check if your focus was off, right?
A. Yes.
Q. And so if we go back to 51, for example, I've already got it up, if you're claiming to see some sort of edge effect here that you're basing your purple color on but it's an artifact, then your entire analysis is wrong?
A. No, this analysis is not wrong. This

Page 119

is chrysotile and I would need to be looking at the microscope here. I stand by this. It's not wrong. And we'll get to that more tomorrow, I guess.
Q. Well, slide 55, as you pointed out, that if this edge effect that you're basing calling this color, this purple, if that's just an artifact of the image and not what you need to be focusing on for dispersion staining, then when you do this calculation, you're putting the wrong number in there, it should be the number corresponding to the yellow?
A. That is not yellow and, you know, if it's this, if it's that. You know, chrysotile, the birefringence can get as high as 0.017. So, it is not wrong.
Q. Okay. So, I'm going to move now to talking about illumination in your Valadez work.
MR. DUBIN: Your Honor, I don't know if you prefer me to stop now and pick up after lunch or go on for a little bit, I'm happy either way.
THE COURT: Do you have any preference, Dr. Longo?
THE WITNESS: Probably might be a good time to break for lunch.
THE COURT: All right.

Page 120

THE WITNESS: Thank you.
THE COURT: Let's meet everyone back here no later than five of one. We're off the record.
(Luncheon recess: 11:54 a.m. to 12:58 p.m., Eastern Standard Time.)

Page 121

A F T E R N O O N S E S S I O N
THE COURT: We're back on the record.
BY MR. DUBIN:
Q. So, just to back up two slides in order to make sure we're staying in flow and understand where we are, if we could back up to slide 51, please.
So, we were talking about the characterization of the colors, which is the first step in the analysis that drives the RI values, everything that's going to go into the calculation. And we were talking about whether this particle that we're seeing here on screen is or is not truly purple, okay, and that's one of the things we were just talking about a moment ago.
And then if we see again slide 55, we know and we're going to talk a little bit about the birefringence formula and how you reached the conclusion that things are chrysotile, but, for example, this first input in the birefringence formula, if you say that this particle is purple, then the value for purple goes into that first step, right?
A. Well, I'm not calling it purple. I'm just calling it the color that we find in that

Page 122

range.
Q. Well, you're calling it RI 1564 which corresponds to the color purple, right?
A. You have taken these charts that they're literally going to be this type of shades when you have different colors in there. This just comes from experience. I know what you're getting at, but I have a disagreement with it.
Q. If we have to go back, you testified, and you agree that you're treating this particle as purple for your analysis, when I went through this with you with the color bar, and we can go back and do that again, but we know, it's a simple thing to get, 1564 in this oil in your temperature in your lab, that corresponds to purple. Are you disputing that?
A. I'm saying that in my opinion, you will get these kind of colors from that area in range, from just the different mineral makeups, et cetera. So, I stick with it. I know --
Q. You stick -- I'm sorry. I apologize.
A. -- It's 1.564 and 1.560.
Q. And typically on the other side of the birefringence calculation for the parallel -- for the perpendicular, I apologize,

Page 123

you're typically calling particles in this analysis, you're typically calling them dark blue in perpendicular, right?
A. Somewhere in the dark blue, I guess medium blue, some light blue.
Q. And for example, this calculation would be different if, in fact, what we're looking at should be yellow and something that's, in fact, a brighter blue, then the whole calculation is different, right?
A. If it's different refractive indices, yes, it's going to have different birefringence.
Q. Right. Because if we go to Longo slide 21, just to again to explain this again one more time to make sure we're all clear, so when we start talking about what your opinion is about why you're looking at chrysotile, not talc, it's going to come down a lot to this birefringence calculation and your opinion that the particles that you're seeing have a low birefringence, in other words, the comparison of the parallel and perpendicular like chrysotile, and they do not have a higher birefringence, in other words, the yellows and blues that you expect from talc, right, when we get to the birefringence calculation, that's part of your

Page 124

opinion?
A. Well, you get yellows and blues especially in 1.550 for chrysotile but it's not the intensity. The whole thing of birefringence is think of it as you're putting shades on a light, and as you push the shutter closer and closer, you're eliminating more and more light to come out.
So in chrysotile, you have about -- you know, I'm just taking -- this much, where in talc you would have this much. So, yeah, you'll get a muted yellow for chrysotile and, say, you know, the 1.568, 569 range but when you compare it to talc in the same conditions, you'll see it's much brighter.
Q. And so, again, let's assume, and for a moment I won't say you, but let's say hypothetically, hypothetically I'm an expert and I want to turn talc into chrysotile for purposes of my analysis in a lawsuit. Okay? Hypothetically.
A. So, hypothetically you want to commit fraud?
Q. Correct.
And so, the easiest way to do it would be to look at the yellow in parallel, and instead of putting yellow there, I would put magenta

Page 125

because that would then lower my birefringence on that side, right? That would be -- I could do that. And then on the other side, instead of putting light blue, I could put a darker blue and that would collapse the colors together so that now the refractive indices that I'm reporting are no longer typical of talc, they're typical of chrysotile, right?
A. I don't know. You have to see how good at fraud you are.
THE COURT: I don't appreciate any of this banter that's going on.
THE WITNESS: I'm sorry, Your Honor.
THE COURT: We have a serious issue, both of you, before the court. So can we get to it.
MR. DUBIN: Sure, Your Honor.
BY MR. DUBIN:
Q. And again, so I want also again -- so when I was making that, the reason I am making that point is, again, we looked at slide 51 and, again, everyone will take a look at it and that particle on that side instead of treating it as yellow, you're treating it as magenta or purple actually, right?
A. That's not yellow.
Q. It's not yellow. Okay.

Page 126

And then we talked a little bit about the effect of illumination on color, so I want to also look at that in the context of the Valadez images, just to see what we can see if we illuminate some of these images a little bit more. And so, let's go to slide 62.

So that's the images as presented. You can see again, what I would say is yellow on the left and blue on the right and that's the classic colors in general of talc, elongated talc. You're saying it's purple and blue but if it's yellow and blue, that's the classic colors for talc, right?

A. Yellow and blue are classic colors but it's the shade of yellow and the intensity.

Q. Great.

A. Not just that blue.

Q. And so, for example, if we go to slide 65 and we raise the illumination on this image a little bit, now we have bright yellow compared to bright blue, the classic appearance of elongated talc in a PLM analysis, right?

A. No. It has to be more intense than that. You're going to need to add some more light.

Q. Let's just do it for a couple more particles. For example, slide 66, and that's your

Page 127

second particle in your analysis. Now let's put some light on that in 67, and with a little more illumination we have a bright yellow and a bright blue, the classic colors for what you would expect in a talc particle in a PLM dispersion analysis, correct?

A. That's getting pretty close to what talc is. I'd have to do the calculation on it, but, you know, this is not its natural color.

Q. Just so we do one more, 68, that's your image.

69, that is with additional illumination and we see the classic colors of talc in PLM dispersion analysis, yellow in parallel, blue in perpendicular, correct?

A. No, I would say that is not intense enough in order to get you to talc.

Q. Okay. Well, let's then go to the next step in your analysis and what you do, and I'll just go back to, first we're going to talk about birefringence calculation.

A. Sure.

Q. So, slide 70, because that's central to how you look at it.

If we go to slide 01, now I'm going

Page 128

to be talking about this last point here, number 5, this, what I have written as biased birefringence calculation method. Okay?

And so, I want to talk a little bit about how that calculation is done in general and then how you do it under circumstances where you claim to see more than one color on the particle. Okay?

A. Sure.

Q. All right. And so, we can go to slide 20. We've talked about this before. This is the basic formula for birefringence, so, the value, the RI value based on the color observed in parallel minus the RI value that you have reported in perpendicular equals your birefringence value, right?

A. That is correct. Right.

Q. And as I said already, if we go to slide 51 again, if you don't report a range, if you don't report a range, then this RI value, RI 1564 that's printed here, that is what would go into the calculation of birefringence, correct?

A. Correct.

Q. And so, if that color is wrong, if that's not purple, then the calculation is wrong in

Page 129

the same way if I did a calculation nine minus four and the real number should be 15 minus four, it's going to give you a different value, right?

A. That is correct. You can't, you know -- in this case we don't agree on what we're seeing there, then yes. If you want to add more to it, you can change it.

Q. What we see here, and again just to make sure we understand ourselves here, that color -- you're not claiming all these other particles up here on the upper right, for example, these rounded particles, that those are chrysotile, right?

A. No, they're not. They're talc plates that you can see some of the plates are radiating. So, you know, in certain directions you can get blue. But no, I'm not saying that's all chrysotile.

Q. Right. And they're basically the exact same color of what you're calling chrysotile in parallel, right?

A. No, it's different.

Q. So, you're looking at this, you're looking at the same picture I am and you're telling me that that image of what you're calling chrysotile is completely different than all the talc that's up

Page 130

on the upper right side -- left side, sorry?
A. If you look on the upper right side, you see a talc plate that has birefringence running in the 1.583 to 1.58 and you see how bright that is and it's in a parallel direction and it has no -- nothing compared to what we're looking at here.
Q. What about all these talc plates on the upper left?
A. Well, those talc plates, again, have a higher on the stack plates, and you're not -- you've got some of these that are almost in the parallel direction -- perpendicular, so every one of those has that. And that bright yellow one there demonstrates that it is talc in and some of the plates are adjusted so it's -- you don't see that on what we're calling chrysotile.
Q. The thing is for talc, the color, unless it's on edge or something like that, the color in parallel should be the same color as talc plates, right? It's the same refractive index in general, right?
A. No. I'm not explaining myself well. Talc plates on edge will give you the exact edge, where now going in, it will give you

Page 131

exactly what you see for a talc fiber. And that one on the right, if you go the third one down in the parallel direction, that's talc.
Q. Again, all I'm saying to you, so these -- chrysotile -- I'm sorry, talc plates are not purple in 1.560 oil, right, or 1.550 oil?
A. I didn't say it was.
Q. But the particle that's got the bars on it, you're calling that purple, right, but it can't -- it's the same color as the talc around it but that talc can't be purple as a matter of basic physics. Isn't that true?
A. What is true is you get these wavelengths in the colors but you will get some that blend and this is where -- for this particular one, this is where we see as compared to everything else. I'm sorry, but I'm sticking with what -- that this is chrysotile and it's not anything like the other little particles around there that have talc plate edges that are causing refraction.
Q. And you're saying it's chrysotile because it has a low birefringence and that's because if we look at this color bar, see how far over to the right 1.564 is, and it's right next to

Page 132

the blues, right, and so as you pointed out before, it's the distance. So, if you're calling the perpendicular blue and you're calling this parallel, it's going to be very close together, that's a low birefringence, right, correct?
A. It is a low birefringence, as it should be.
Q. But if I treat this particle as yellow and not purple, then I have created more distance from the blues and my birefringence value is higher, right?
A. No, you're not right. If you want to treat it like yellow, then treat it -- it doesn't show anything like the yellow talc plates that we have on edge here in the right-hand corner. That's talc and that would be in the 1.583 range or so, that 420.
Q. I'm just asking you to agree with a simple proposition: Let's assume my perpendicular is blue, okay, and let's tag it, it doesn't matter, where we can see 1.562, okay, blue, if I have in parallel, and I'm saying I have purple in parallel, there's not much distance there, that's a low birefringence, right, correct?
A. It's a low birefringence because of

Page 133

the intermixing here. Let's just take a look at the 1.561 810.
So, you have what talc looks like and then we're arguing over where that should be. That doesn't look yellow to me. It looks more like a golden, dark goldish brown with some purple in it.
Q. So, anyway, but, for example, if one of these illuminate slides -- just bring up 69 again. If I put that on the color chart, right, so perpendicular blue it's going to be -- brighter blue it's over here, brighter yellow it's over here, that has a very different birefringence value than if I'm comparing purple to dark blue, right, correct?
A. Correct, yeah, if you -- if you put artificial lighting into it, you're going to change the birefringence. I have no doubt about that.
Q. Okay. And if you call it the color that it's not truly there, you also change the birefringence, correct?
A. I can't tell you about it if you call it something that's not there. We've analyzed that correctly.
Q. Again, the topic of this section is your birefringence calculation, so I want to talk about another thing that you do to make

Page 134

birefringence smaller, in other words, more like chrysotile.

And so, let's look at slide 71. This is an example, just for illustration purposes, of a particle that you have reported a range and we're now back in the old Tungsten light ones, that you've reported seeing a range of colors here, right, everywhere from 1.562 to 1.569, according to the little green numbers there, right?

A. Correct.

Q. And so, what I want to explore is in these kind of circumstances how you calculate birefringence because the ultimate calculation is going to require one number in each box. Okay?

And what you have said that you do, you said you do it -- you do it multiple different ways, right, over time?

A. No. I mean, when we have a range, we take the highest gamma and subtract out the highest alpha, and then we take the lowest gamma, which is the next one, and subtract out the lowest alpha. That's the way we do it and that's the way other Government agencies do it.

Q. We'll look at that in a second.

So, high alpha minus -- I'm sorry,

Page 135

high -- right?

A. High gamma.

Q. -- high gamma minus high alpha equals birefringence in the way you do it, right?

A. Not the way I do it. It's not my method. The way the Environmental Protection Agency does it. The way that Deer, Howie and Zussman, the mineralogical book, does it. It's the way that FDA proposed to do it when they had that method out and back in the '70s to determine the birefringence. Whenever you have a range, we're doing it the way others do it.

Q. We're going to look at that. I just want to make sure because mathematically this will probably be the same thing, at least if you're dealing with a single particle. But originally what you had said is that you were using averages, right; in other words, if you had a range from 1.568 up to 1.562, you were using averages, you were averaging the two numbers to what you put in, right, and that is how you've explained your methodology at times, right?

A. Yes. If you average them, you'll get the exact same number as if you take the highest alpha and the highest gamma and so on.

Page 136

Q. Right. And other times you've said that instead of averaging based on specific particle, you will group a set of particles together that you view as representative and then come up with some average based on that, right?

A. I don't know if you explained it properly.

Q. Okay.

A. We take representative particles and we get the refractive indices for all of them and this is all in the same sample. Then we do birefringence for each individual one and then average them up and just say here's the average overall.

Q. And you didn't have any specific protocol about how to select the particles that were going to go into that average, right?

A. The protocol is, is that you look for ones that are common throughout the sample. I think we've talked about this before.

Q. Yeah, and I asked you, I asked you at 1., again the averaging method is the same result as high verse high, right?

A. Yes.

Q. And I asked you, and you admitted

Page 137

that you didn't know anywhere any published technique in the scientific literature that said to use averages for birefringence calculation like this and you admitted you didn't know anything in the scientific literature that said to use averages, right?

A. Right, but you realize, though, it doesn't change anything about the birefringence even if you do the range. So, I just did it to make it easier.

Q. But I'm just telling you, we'll talk about what impact it can have on birefringence, but you didn't know anywhere in the published scientific literature that did the analysis the way that you were using averages; that's what you admitted to me in the Prudencio case, right?

A. That's not fair. We're using -- we're using an averaging that didn't change anything on how the Environmental Protection Agency does the birefringence on their -- on their chart, on 2.2, how any -- biaxial mineral in Deer, Howie & Zussman, when they give all the different ranges of refractive indices and birefringence, if you do it like I just said, take the high and high and low and low, you get exactly what they publish.

Page 138

Q. We're going to talk about the methods in one second. I just want to make sure that we're clear here, and so maybe we could pull up slide 72.

I asked you, you don't know of anywhere of a technique that -- use of averages instead of high-low, you don't know of anywhere where that technique that you're using has been published or put into a scientific method, right, and you said, I'm not aware of any, no.

That was your testimony under oath, correct?

A. Using averages instead of high-low. We don't use a high-low.

Q. I know you don't. We're going to talk about that.

A. That was part of your question.

Q. Right, but --

A. There is no publication out there that shows you how to do a high-low, and shows you the calculation, zero.

Q. I asked you the question whether you knew of anyplace where it said that you could use averages instead of high-low, and I'll show you why I asked you about high-low in a second, and you didn't know of any place that had been put in a

Page 139

scientific method to use the averages, right?

A. That's not what that's saying. There's no method out there because it's completely utterly wrong. You're not going to have a scientific method out there that has you doing something that's no basis anywhere.

Q. Okay.

A. That wasn't a half a question there.

Q. Let's look at the methods then and compare it to your calculation. And so we can do this, maybe it would be a little easier to put it on a slide, slide 73.

So you said, I'm going to use this example because it's a little easier to compare with others, you said the averages -- "and I think mathematically that's true using averages of two ranges will be the same results as using the high gamma minus the high perpendicular in the range," right? So, this accurately reflects what you do, right?

A. Yes, sir.

Q. And so, what we're going to discuss next is how it should be calculated under the methods, and so that's slide 74, and I understand you're going to disagree with me but then we're

Page 140

going to show it in the methods.

So you understand that we believe, our experts believe and we'll show why, that the proper way to calculate birefringence is not by taking the high on the parallel and the high on the perpendicular, but rather to do it from the high gamma and then the low alpha, the low one, the one on the other side of where you're picking, right, and that's criticism that has been made of your work, right, that this should be the way birefringence is calculated, and you think that's wrong?

A. I understand that the experts you hired have decided this and it is wrong.

Q. Well, I want to look now at the methods and see what they say. So, one method that you purport to use in your analysis is ISO. In other words, if we see in your reports there's going to be a lot of ISO method PLM, right?

A. Correct.

Q. So, I want to look at what the ISO says about how to calculate birefringence values.

So, let's just call it back up. I think I've already marked this. It's Exhibit 2. And we can going to page 13 of it. We're going to

Page 141

have to go back and forth between this and the slide.

Okay. So, it has a definition, it should be under gamma, okay, and so it defines the gamma refractive index, and if we know that -- that's going to be the first number in the equation, it's going to be what's in parallel, right, gamma?

A. Correct.

Q. Okay. And that is defined as the highest refractive index exhibited by a fiber, right?

A. Correct.

Q. And so, when we want to say highest, I want to make sure we understand what that term means. And so as an example, before we come back to this, let's look at slide 71, which we looked at before. The highest refractive index, you see how the numbers go up from 1.39 to 1.50, and then they start going up as we go towards the yellow, 1.578 to 1,580, you see it goes up, higher numbers, right?

A. As expected.

Q. As expected, of course.

So when we're talking about the highest color observed in parallel in gamma, that is

the furthest to the left, right, 'cause the numbers go up?

A. True.

Q. Sure, correct.

And then if we talk about the other side of the equation, ISO also defines what that is, the alpha refractive index, so if we can go back to the document, D-2, page 9, and that is defined not as the highest refractive index but now the lowest refractive index exhibited by a fiber, right?

A. Yes, sir. If you put those two together, the gamma's always going to be the highest.

Q. Correct.

A. The alpha is always going to be the lowest. It doesn't say anything in that definition that if you have a range, you pick the highest in gamma. If you have a range of alpha, you pick the lowest. Nowhere is that ever printed and the actual methodology itself in ISO has nothing to do with subtracting out anything. You use the Michel-Levy charts.

Q. And so, again, there are ways to calculate birefringence in a particle without using refractive indices; is that right?

A. Well, you're using the first order, second order light and you go to the Michel-Levy charts it will tell you where you are on they're based on the density -- excuse me, not the density -- but the height of the bundle, 'cause on the X axis it has a zero to 100 microns there, and that width of that bundle can change where your birefringence is.

Q. Anyway, since that's a different -- we're just going to focus on what we're doing here but it's defined as the lowest refractive index exhibited by a fiber, correct?

A. Yes, alpha is the lowest if you have biaxial.

But here's my point: If this was really what you say, in order to go in and do a mathematical equation and take the lowest and the highest, why doesn't the method show you anywhere how to do that. It doesn't make sense for a method because methods are like a recipe, and they just go into using first order, second order Michel-Levy charts that has nothing to do with this. This is just a definition.

Q. Let's look at what the lowest refractive index exhibited by a fiber would be, so,

let's look at Longo slide 22, this is now perpendicular.

And so, if I'm seeing a range, let's assume, theoretically, I've got a particle that has a range of refractive indices in parallel from one -- that's not what this black bar is intending to represent but I'm just doing it as an example -- 1.553 all the way to 1.547, the lowest refractive index that is exhibited by that particle would be the 1.547, in other words the furthest to the right, it's the lowest number refractive index, correct?

A. If your hypothetical is correct, that would be correct. It is the lowest one in your box.

Q. And then if we go back to the method, and that is D-2, I guess, it has another definition and it defines birefringence as the quantitative expression of the maximum difference in refractive index due to double refraction, right?

A. That's what it states. You read it correctly.

Q. And looking at the same example we just were, slide 22, it's only going to parallel this but if I have a range, let's assume I have a range in blue and I also have a range in yellow, the

maximum difference between the refractive indices of the particle is going to be the one all the way -- the one farthest to the left against the one farthest to the right, the highest against the lowest, right?

A. No. You're completely wrong on this. And the reason is, all protocols, methodologies have a step by step by step by step. If that's what that truly meant, then they should have a range there and show you that calculation. They don't. Alls they have is the Michel-Levy charts that has nothing to do with this. And yes, the gamma is the highest refractive indices. The alpha is the lowest. It has nothing to do with the ranges.

Q. So, you're reading the word "maximum" out, right, because what it's advising you to do is to use averages on both of these, that's the way you're supposed to do it, 'cause then you would have a single number on one side, a single number on the other side, and there would be no maximum or minimum difference, it would just be one difference, you wouldn't be having a range. So, how does the word "maximum" play into your understanding?

A. Because there is a maximum no matter what, because you have to go to the Michel-Levy

Page 146

charts. And if you're taking, quote, the highest or the lowest, if you take the highest and you subtract the lowest out and you take chrysotile standards and do that calculation, it doesn't make it chrysotile anymore. I'm not talking about talc. And there's nothing in the method that says to do that. You can't just have a definition and then go in the method where it's completely different for the birefringence. And the birefringence in the ISO, alls you're supposed to do is say low, medium and high. You don't give it a number.

Q. But the calculation is what leads you to say whether it's low, medium or high?

A. That's when you do the PA method, yes. But they will call it low -- you look at a lot of them. They'll call it low, medium or high with no calculation, just looking at the Michel-Levy charts and if it's a first order, second order -- first order or second order from the cross polars, that's where you get it.

Q. Let's look at some other methods. Let's just start building a slide here.

THE COURT: Before you go on.

MR. DUBIN: Of course.

THE COURT: What are the Michel-Levy

Page 147

charts and what is the significance of them?

THE WITNESS: The Michel-Levy charts is an individual, I think he was from France, who came in and said first order light, under cross polars, meaning you have a polar here and polar here, and you usually get dark blues and blacks, et cetera. You look at what they call that first order. Then you go on his chart, first order, et cetera, take the -- take the width of the bundle and then go across and it gives you your birefringence. So, it's a way -- it's a different way to determine birefringence and it's the way I would say 90 percent of the -- 95 percent of the polarized light microscopy labs do it.

THE COURT: Thank you.

THE WITNESS: They will say low birefringence, we talk medium or high. Here it's calculated.

MR. DUBIN: And so, Your Honor, I'm focusing with this witness on the way he's calculating it. We are going to discuss what his method is, but it's not really for this witness because that's not how he's doing it.

THE COURT: I understand that, but we're using terms that --

Page 148

MR. DUBIN: So, I -- I apologize - --

THE COURT: -- need to be defined for the record.

MR. DUBIN: I understand. I just wanted to make sure that you understood that we are going to explain that in more depth at some future time. I apologize.

THE COURT: I need to understand it for this witness.

MR. DUBIN: I apologize.

BY MR. DUBIN:

Q. All right. So, anyway, again, you seem to be disputing this but let's put up Longo slide 76. I'm going to start building this because this is our position about what ISO does verse you and I want to now move to another method and so I want to talk about Dr. Su's method that I believe has also been marked. Are we able to pull that up?

This will be the next exhibit, D-11. (Handing.)

A. Thank you.

Q. And so, we can call that up. Can't call it up, okay. So --

THE COURT: Indicate what this is for the record.

Page 149

MR. DUBIN: This is an article of Dr. Su's, Rapidly and Accurately Determining Refractive Indices of Asbestos Fibers by Using Dispersion Staining Method. Okay? And we're going to talk about the section at page 3.

BY MR. DUBIN:

Q. So, this says, when you are looking at the colors, a range of color is usually displayed, make sure that the DS color that gives the highest RI's are observed, i.e., the DS color corresponding to the shortest wavelength; for example, if the DS color ranges from purple to red purple, choose red purple, right?

You see that?

A. Where are you reading?

Q. In section 7.

A. Section 7. Where is section 7? Page 3?

Q. Page 3.

A. Section 7.

THE COURT: I think it's on page --

A. Section 7 on page 5.

Q. Sorry, page 3 of the document, page 5 of the PDF.

A. Okay.

Page 150

Q. It has both of them, so, I was starting with the bottom -- the parallel. And so, let me make sure we're looking at an image so we can understand this. Let's bring up Longo slide 22.

So it's saying here that if you -- if you see multiple colors, for example, if the color ranges from purple to red purple, right, so, in other words, purple is further that way to red purple, you're going to -- it says choose the red purple, right?

A. Where does it say that?

Q. In number 7.

A. Oh, okay, number 7 is on page 5.

Q. You'll see number 4 it also says if you get a range from blue to light blue, choose light blue, right?

A. That's what it states.

Q. So, in other words, where you're having a range or you're taking the colors at the ends of the range, not an average to compare under this method, right?

A. That's what it states.

Q. Okay. And so, again, we can now look at slide 77 and you mentioned EPA regulations, EPA R-93, right, there's a Federal regulation about how

Page 151

to do PLM analysis in that context, correct?

A. No. What I was pointing to is the chart on 2.2 where they go into a range of gamma, a range of -- of alpha and they have four chrysotile structures, and if you take the high gamma and subtract out the high alpha -- they also have a range of what chrysotile is for birefringence, 0.004 to 0.017. So, if you use what you're calling the Longo birefringence method, all the calculations on those four chrysotile structures will be in what EPA is saying the range of chrysotile is for birefringence.

If you use the highest and the lowest, I think the highest was 0.6, and the overall average was 0.04, which has no basis at all for chrysotile. If you go to Deer, Howie and Zussman and do the exact same thing for every biaxial mineral that's in there, everything from tremolite, anthophyllite, vermiculite, and use what you're calling the Longo's birefringence, it all works out to the range of birefringence they state. If you want to do an average like, I mean, Dr. Su is doing, you'll get the same thing.

Q. Well, the method itself has a definition of birefringence, right, EPA R-93?

Page 152

A. No. I don't think they have it in there. I don't think they do. You wouldn't have asked me that if you didn't already know.

Q. Probably not.

A. Some day I'll get that straight.

Q. (Handing.)

A. Thank you.

MR. BRALY: What number is this?

MR. DUBIN: It's Exhibit 12 and that will be the EPA R-93 test method.

BY MR. DUBIN:

Q. So, for example, so, slide, 78, and let me tell you where that slide is from so you can look yourself.

A. Thank you.

Q. It's at page, PDF page 71 of 98.

A. 71 to 90?

Q. 98, sorry, I'm sorry, it's page 71 of 98.

A. Oh. I was going to say that's a long birefringence definition.

Q. Serious detail.

And so, they define birefringence value as the numerical difference between the maximum and minimum refractive indices of an

Page 153

anisotropic substance. So, again, maximum, minimum because we're dealing with a chart, so, it would be the furthest one on the left and the furthest one on the right is the way you would get a maximum difference, correct?

A. It doesn't work that way when you are doing these calculations. Here they say use the Michel-Levy chart. If you want an example, we can do the calculations on the EPA or any biaxial crystal in Deer, Howie and Zussman, which I understand is the mineralogical book.

Q. I'd like you to explain it to me again, so, if we go to slide 79, is if you have two options, right, you could compare the highest number on one side, which is going this way and the highest number on that side, or you can compare the highest number on this side to the lowest number on the other side. Which of those is going to present the maximum difference?

A. Well, obviously the ISO, taking the highest and the lowest, will give you the maximum difference, but it's giving you a wrong answer. Getting the maximum difference in something that is a wrong answer and gives you a birefringence that has nothing to do with the mineral you're looking at

Page 154

is not right.
Q. I just want to just do some math to make sure we're clear. Again, if we go to slide 21. And, of course, all of these calculations, in addition to the method depends on getting the color right first. But to make sure we understand, your opinion is that chrysotile will have a lower, in other words, closer together, birefringence than talc, right?
A. It's almost five fold times lower.
Q. So, I want to use an example just so we all understand how using the maximum and minimum is going to change your result versus using high and high, or average, so we can look at slide 80.
So, I put together some heights here spaced out. We can view one as the parallel range, which would be the left, and one of the -- the perpendicular range on the right, parallel range on the left. And so, if we were going to do this and we go to slide 81, compare the tallest person to the shortest person in these ranges, the maximum difference between the heights of any of these two individuals, any of the two individuals in these groups would be the difference between the 80-inch tall and the -- inches -- and the 60-inch tall, that

Page 155

produces a 20-inch difference, right?
A. If you want to measure people like that, that's what you would get.
Q. But if I take, let's say I take the highest of the highest, which is what you say you do, which is slide 82, now I'm comparing an 80-inch tall person to a 68-inch tall person, I've reduced the difference to 12 inches, right?
A. Yes.
Q. And similarly, when you've said you would do averages sometimes, and that would be slide 83, if I take the averages in the range, I'm going to get the same thing as high and high or 12-inch difference, right?
A. If you do that with people, that's right.
Q. And so, if, in fact, the way to do birefringence is represented by slide 81, by doing it in a different way, by doing averages or high to high, you will naturally lower the birefringence of the particle and make it more like the birefringence that you say is typical of chrysotile, right?
A. No. We're doing it the right way. What you're not thinking about -- think about if you have a range of fibrous talc where you've got this

Page 156

low and this high and you do that, now it's not fibrous talc anymore, if you didn't have anything below 0.045, it's not talc. I'm sorry, it's wrong. It's not the way, it's not -- yeah, it's a way to make it not chrysotile but it's absolutely wrong to do the birefringence that way, that you're going to take the lowest and the highest.
Q. Okay. I want to move on to the next major topic, chrysotile, and I think it's probably the last major topic on that issue and that is slide 84, Calidria asbestos.
And so, if we can return for a second, I think it was slide 5, one of the things I asked you about when we started out was the idea that, okay, what kind of work were you doing back in this green period and why were you not claiming at the time to find chrysotile in Johnson & Johnson, and I think what you told me was the variable was that your understanding or your lab's understanding of Calidria asbestos, right?
A. Is that a question?
Q. That's what we went over earlier. I'm just trying to summarize --
A. Yeah, we went over Union Carbide's Calidria 2010 and the RG-144, which had very similar

Page 157

properties to what we were finding in cosmetic talc. That was down the road here a little piece.
Q. So, when would these analysis when you were giving the testimony back in the day, you know, about there not being asbestos in talc, when was that testing that led to that testimony done?
A. You mean back in 2000?
Q. No. I mean before 2016, back in the day when you had been -- you originally said you hadn't tested but you had tested in the past and you had gotten negatives. When would that testing have been done?
A. Well, the best we know is 2013, 2009 and -- well, we're not sure about the third one because that was the Richard Hatfield one.
Q. Okay. And so, I think one of the things you said is at some point your lab got to do some -- look at some Calidria and remind us when that was?
A. 2015 or 2016 or so, 2014.
Q. So, my understanding is you're saying that the first time your lab got an opportunity to look at this Calidria stuff was after you had already tested whatever products you tested that you said you didn't find asbestos in, right?

Page 158

A. No. I guess I'd go all the way back to 2004 when we received five pounds of -- of Vanderbilt's Nytal and we did testing on that but that was a whole different size range. Nytal 1 or Nytal A, you had lots of bundles and stuff in there that were a hundred microns, 50 microns. That's the first time we started testing it.

And then we tested Visbestos with the attorneys there and I think that was 2014, 2015.

Q. We'll look at the dates in a second.

Did MAS participate in the NVLAP proficiency exam that involved testing laboratory's ability to identify the mineral Calidria?

A. We looked high and low to see if we could find that. We could not find that analysis.

Q. You can't find the analysis. Do you know whether you participated?

A. I don't know. That's too long ago.

Q. Because that was in 2001, right?

A. Yes.

Q. Is that correct?

A. I think that's correct. Where 35 percent of the labs failed, something like that.

Q. So, I want to make sure we understand when we use the term Calidria that we know what

Page 159

we're all talking about. So, slide 85.

So, Calidria is, actually, just -- is a brand name for a particular type of chrysotile asbestos, right?

A. Correct. It's like amosite. Amosite is not a mineral. It's the asbestos mines of South Africa. So, it's just a tradename.

Q. The name comes from California and the New Idria serpentine deposit, right?

A. That's right, good for you.

Q. Been there, so...

And the chrysotile from that area is typically considered to be a unique chrysotile formation that occurs there and perhaps one mine in Yugoslavia, right?

A. Correct.

Q. In fact, you said you've never seen, I think -- the chrysotile from there is completely different from chrysotile that you find in Canada, Vermont, Arizona, places like that; it's a different sort of morphology is what you said, right?

A. If you put Calidria in like a Ziploc bag, it looks like flour. If you take chrysotile from Canada or 30 other places, it's almost like cotton candy.

Page 160

Q. As I understand it, your theory is that because laboratories out there don't understand what Calidria looks like, that's why they're supposedly missing chrysotile in all of these talc products, right?

A. That's what I think. There's got to be a reason that other people aren't finding it except with TEM are the ones I know about.

Q. And so, your theory is that this unique form of chrysotile that's found in this one location in California is the type of chrysotile or the appearance of chrysotile that is found in talc from Vermont, from Italy, from Montana, from every other mine, talc mine in the United States, that somehow this unique type of chrysotile structure that has only been found in this one mine in California has somehow jumped into talc from every area in the United States and from Italy, right?

A. Now you're being silly. I'm sorry.

No. It's not jumped in there. And also, these materials have been milled. You can go to the RG -- the SG-210 chrysotile without us doing anything has an average length of 10 microns, the RG-144 without us doing anything has any average length of about 80 microns. So, this not formed

Page 161

that size. This is after it's been milled you get to that size, at least -- and why is that size in the chrysotile? Well, some may think that the milling won't do that --

Q. Okay.

A. -- for chrysotile 'cause, you know, it has such high tensile strength, but we're not talking about your average ball mill. These are big monster machines that have a lot of force. I don't have another explanation why they look so similar.

Q. Well, let's first just talk about whether it does look similar, whether we assume -- let's talk about what Calidria should actually look like and whether it looks like what you're claiming to find in Johnson & Johnson talcum powder products. Okay?

And so, we're going to start out with that by talking about an analysis that your lab did of Calidria asbestos in a product called Visbestos, which was essentially bagged of asbestos to be used in the drilling mud industry, and it was Calidria, right?

A. Correct.

MR. DUBIN: And so, let's mark that next, Exhibit 13.

Page 162

BY MR. DUBIN:
Q. All right. So, this is 13, and it's a report from MAS signed by you about Asbestos and Super Visbestos Testing and you can see it refers to these as Calidria samples, right, on the front page?
A. Yes.
Q. Now, there aren't PLM images in here but the report contained data about what the refractive indices were that your laboratory was reporting for Calidria using PLM analysis, the type that we've been talking about, right?
A. Correct.
Q. And so, we can see, if we go to page 6, for example, as an example, you'll see that you get -- there's a refractive index number on page 6 giving -- so, the range that you're reporting in parallel verse perpendicular, you've got 1.560 and 1.553, right?
A. That's right.
Q. Okay. And so -- and if we go to page 7, there's another one of those. Your lab is reporting refractive index for this Calidria, 1.560 to 1.553, right?
A. That's right. That's what we reported.

Page 163

Q. So, I want to talk about what colors that would mean your analysts are saying you were seeing looking at Calidria in 1.550 oil.
And so, first, I want to remind us about what you are calling this Calidria type chrysotile in Johnson & Johnson, and so let's call back up slide 26.
So, you claim that this particle that we're seeing here that you've identified in Johnson & Johnson, you claim that that is chrysotile similar to Calidria asbestos, right?
A. Yes, sir.
Q. So now let's look at the refractive indices that you reported back before you were doing this analysis claiming to find chrysotile for Calidria and see what colors your analyst was saying they were observing. Slide 86.
So, in parallel, which we just looked at the picture of alleged chrysotile in Johnson & Johnson in parallel, your analyst was reporting that when they looked at Calidria, it was magenta in color, correct; that's what they were reporting the refractive indices --
A. 1.561 -- it's close to it, yes.
Q. And so, if we go back to the last

Page 164

slide for one second, are you calling that magenta?
A. No, it's -- I can't read the ranges. I still can't.
Q. Well, I'm just saying looking at it, are you telling me with your eyes that's magenta?
A. No. But it will have -- and you're looking at one big bulk analysis versus, I don't know, hundreds where Visbestos, I mean, the standard, we get them everywhere from about 1.560 up to about 1.570. That's our ranges that we see with Calidria, as well as the others. You're not going to get the exact same refractive indices each and every time. There's a range there that we see each and every time. Sometimes you might have a 1.571, and sometimes you might have a 1.588 -- excuse me -- 558.
Q. But basically what you're reporting here, if we go back to slide 15, what you're recording Calidria should look like in parallel, that is very similar to what ISO is saying any type of chrysotile should look like?
A. ISO never says that.
Q. It gives a refractive index value for this particle in parallel, right?
A. 1.560 Calidria does not look like

Page 165

that.
Q. Okay. What color is -- are they --
A. It is more of a purplish pink at that -- it's not like that. That's pretty low on the spectrum.
Q. Let's go back to slide 18 because it has it. We went through it. That's 1.556. So, let's show what that looks like on the color bar.
So, in other words, the ISO reference gives you a refractive index and it gives you 1.556 in the reference number corresponding to this magenta color, right? That's what ISO says this particle, this reference particle is, right?
A. What we have is 1.560, which would be not 540 but it would be about 5 -- about 510.
Q. If you go back to slide 86, your parallel is right around that classic chrysotile, that's parallel to parallel, it's in this area?
A. Well, what you were showing was down. I'm saying it's about 505 for the 1.561.
Q. We can agree that neither the ISO reference difference for chrysotile nor the values you reported for Calidria here in parallel are yellow, right?
A. No, but you'll see some tomorrow.

Page 166

Q. Okay. Well, let's look at the other side of the equation. And so, you gave some numbers, for example, slide, I think it's 87, and so, you're reporting that in perpendicular, the Calidria would be a dark blue, fairly close to its parallel, classic low birefringence, chrysotile, right?

A. Yes, sir. But interesting enough in the perpendicular, I would say 50 percent of what we see is in the range what one would say was for chrysotile.

Q. And so, I want to talk about, because a lot of the images that we've been comparing, for example, the Valadez images about is it purple, is it yellow, those were in a different oil, 1.560, and so, I want to look at that.

And so, to remind ourselves what you're calling chrysotile in Johnson & Johnson, in 1.560 oil, we can go back to slide 90, and so that's an example of what you are saying in 1.560 oil is chrysotile, according to you, chrysotile in Johnson & Johnson and it is Calidria-type chrysotile in Johnson & Johnson; that's what you are asserting, correct?

A. No, not quite. It's a little -- kind

Page 167

of close but not quite.

Q. Okay. What's the "not quite"?

A. What I'm asserting is that many of the structures that we see, not only in Johnson & Johnson, because everybody uses the same mines but all of them have more of the type and look we see and also the ranges we see with the -- the SG-210 range from about 1.60 up to 1.71, with an average of 1.56 -- excuse me, 1.565. That's the average that we find for the Calidria. That's the average we're finding for what's in Johnson & Johnson, as well as the other mines.

Q. Okay. And so, I want to look at some examples of Calidria in 1.560 oil to compare. So, first, I just want to look at an image from Dr. Sanchez' lab that we'll be looking at later in these proceedings, because, as you said, when you raise the refractive index oil like you did, that means that things that may have been sort of (inaudible) or even, particularly blue, are going to move further in parallel towards the right, right?

A. Correct.

Q. And so, if we look at slide 91, we have an image here of what Calidria is in 1.560 oil and I want to start by talking to you about some of

Page 168

these brighter spots, right, the stuff that doesn't look as purple and blue. And I think what you've agreed is that even if we're just looking at Calidria, there are also sometimes other minerals that can be contained in Calidria as well, right?

A. According to Dr. Gunter, there's like one or two. So, it's not that many.

Q. Okay. Well, for example, brucite, right?

A. Brucite's one of them.

Q. And you're familiar with an article entitled Chemical and Physical Characteristics of Amosite, Chrysotile, Crocidolite, and Non-Fibrous Tremolite for Oral Ingestion Studies by the National Institutes of Environmental Health Sciences? Are you familiar with that, you've cited it before?

A. I have not cited it before.

Q. Are you familiar --

A. I'm not familiar with it.

Q. Okay. So, were you aware that Dr. Wylie did a characterization of Calidria for the Federal Government as part of some studies that were being undertaken?

A. No.

Q. But anyway, I think what you've

Page 169

agreed is at least it's important to make sure that when you're looking at a Calidria sample and you're trying to match something up with the talc, that you're looking at the actual Calidria; we can agree that it's important that you're looking at the Calidria, right?

A. Well, not the Calidria that looks like that. That's just like a mass. That's not something that we typically look at. And I don't know what Calidria this is since there was a number of different menu items for Calidria, so, we don't see that.

Q. You don't see this kind of blues and purples in at a time background, this massive blue and purple; you don't see that, right?

A. If you're between 1.560 and 1.562, you will get blue. But we don't see this, I don't know what to call it, a big mat, of very small structures and particles, no, that's not what we see when we look at the SG-210 by PLM.

Q. Is that because your images are under illuminated?

A. No.

Q. Okay.

A. No, it's not.

Page 170

Q. We'll look at that in a second.
So I want to first just look at an example of one of the things that you're calling Calidria in Calidria, okay, and just try to just eyeball it, so let's go to Longo slide 92.
And so, here is a particle you can see of what you are using as a reference for Calidria, right, and so, this is now a picture no longer in Johnson & Johnson but within a sample of Calidria asbestos.
Do you see that?
A. Yes.
Q. Okay. And you're focusing on this particle right here, correct?
A. That is correct.
Q. Okay. And so, I want to compare the images for a second, slide 93. So, we have an image from your lab, an image from Dr. Sanchez' lab, right?
A. If you say so, yes. It says Dr. Sanchez on it.
Q. And you said that you don't see stuff like Dr. Sanchez's in your images, right, the big mass of purples and blues, right?
A. That's correct.

Page 171

Q. Okay. And so I want to try to turn the illumination up a little bit on your image and see what happens when we turn the lights on. So, let's go to slide 94.
So, now we can actually see all the stuff that's the Calidria in the background that we could not in the image that you included in your report, right?
A. Yes. Well, sort of, but certainly it doesn't look like what Dr. Sanchez had.
Q. Okay. Let's just focus, let's just assume that you didn't just pick some impurity in Calidria to look at instead of the mass of the chrysotile that we see in the background, let's focus even just in on that particle and let's look at slide 95.
So, this is the particle that you selected out of the Calidria reference on the left and this is what you're calling chrysotile, Calidria-type chrysotile in Johnson & Johnson on the right, you are asserting that those are the same mineral, right?
A. I have never ever said that. What I said is it has the same characteristics. You're going to have the small size and you're going to

Page 172

have the ranges that we're seeing from 1.560 up to about 1.570. I've never said it's identical to it.
Q. Well, you're saying they're both chrysotile, right?
A. Well, of course.
Q. And you're saying that the reason why you're able to identify this as chrysotile on the right is because it looks like Calidria, right?
A. It has -- we have Calidria that has the same look as that. It's always going to be a range of refractive indices. This is not like chrysotile added products where you're going to have those giant bundles and you can say, oh, here's the color, here's the range. This has the same size. It has the same range. I think that was 1.560 and I forget what the other one was. So, I never said it was identical.
Q. Well --
A. You can get chrysotile from Canada that's the 1866, and you'll have different refractive indices but it will be in the range that they like.
Q. Let's turn the lights on a little bit on this image, too, because this went back to original illumination, slide 96, and we can see

Page 173

these are not -- the whole point of PLM dispersion analysis, when you're looking at a mineral, is to see what color it is and what mineral that matches, right? And these are different colors, right, they're different colors?
A. You're not going to get the exact same colors. It's a whole -- we'll show you tomorrow. There's a whole range of colors for the Calidria. There's a whole range of colors for what's found in Johnson & Johnson and those colors range usually -- I think the lowest we've seen in gamma is 1.559 or 1.558, and the highest we've seen is 1.570 or 1.571. The average is 1.565 for the Calidria, and for what we see in the different talcum powder mines including Johnson & Johnson's.
Q. And these bright yellows or brighter yellows that you're seeing in the talc over here on the right, you're not -- you're not seeing -- these are not the same refractive indices, right. These are not the same refractive indices?
A. Well, it's not the same type of sample. The Calidria is like out of the jar, doesn't have talc in it, wasn't formed with talc. Chrysotile being formed with talc is going to have some of the talc characteristics.

Page 174

Q. Okay. Thank you. At this point I'll pass on the chrysotile issue. I think we're going to do that before we proceed to other issues.

THE COURT: Why don't we take the break now then. So, see everyone --

THE WITNESS: Thank you, Your Honor.

THE COURT: You're welcome. Please don't hesitate to speak up if you need an earlier break.

See everyone back at 2:30. We're off the record.

(Recess: 2:15 p.m. to 2:32 p.m., Eastern Standard Time.)

THE COURT: Mr. Braly, whenever you're ready.

MR. BRALY: Thank you, Your Honor

CROSS-EXAMINATION BY MR. BRALY:

Q. Well, good afternoon.

A. Good afternoon.

Q. I want to talk to you about your methodology that you use to analyze chrysotile in talcum products including Johnson's talcum powder. Okay?

A. Sure.

Q. One of the first things I want to

Page 175

talk to you about has to do with something that came up in the questioning but it had to do with polarized light microscopy and transmission electron microscopy being two different types of ways of looking at microscopic things; fair?

A. That's fair.

Q. Are there relevant strengths and weaknesses of these processes?

A. They both have strengths and weaknesses.

Q. Is it a well understood and standardized methodology to identify asbestos, including specifically chrysotile in talc, through polarized light microscopy?

A. Yes.

Q. I am going to attach your resume at some point to this record, so I'm not going to go through this a lot. But as far as testing products that contain asbestos, is it something that you've done for the last 40 years?

A. It is.

Q. Okay. The testing that you performed on talc products, is that a more recent thing than your testing that you've done on traditional products intentionally, including asbestos?

Page 176

A. Well, not for the industrial talcs like Vanderbilt. We've done a lot of testing on those but that one -- that's really not an issue because even by polarized light microscopy, you can find two to three percent primarily anthophyllite, and tremolite, and something along the lines of about 30 million tremolite anthophyllite bundles per gram of this talc. So, that's really what I was working on for a lot of years, is that part of it.

The cosmetic talcs was in a whole different group. You have to understand that MAS at one point had laboratories in Atlanta, laboratories in Raleigh, North Carolina, a laboratory in Phoenix, and a laboratory in San Jose. So, those mainly did all semiconductor work than did the other. So, we had almost 100 employees, a lot of Ph.D.s with social issues, it was very interesting some of the Ph.D.s.

So, I was not involved in everything. No was no way I could look at all the reports, et cetera. I was only involved with stuff that I was doing, and cosmetic talc wasn't one of them where I was involved in the analysis.

Q. One of the things that was pointed out had to do with a timeline of testing relative to

Page 177

cosmetic talc.

Do you recall that, the timeline with the years?

A. Yes.

Q. Is there a reason why your testing of talc ramped up or became, why it became more active during the litigation once documents became produced to the litigants?

A. Because the documents themselves basically -- well, they do, if you go through them, all those documents, there's nothing that I've been finding in these cosmetic talcs that hasn't already been found by other scientists and other consultants for Johnson & Johnson.

Q. That's something that we'll look at, at the end. But has chrysotile been found in Johnson & Johnson's products absent -- separate and apart from your findings?

A. Yes.

Q. The methodology that you use to analyze by polarized light microscopy talcs in the presence of asbestos, is this a well founded and well understood methodology?

A. Yes, everything that we do follows the ISO or the EPA protocol for analyzing something

Page 178

with polarized light microscopy.
And when we say "polarized light," we mean, for example, that white light up there with the little yellow in it, those lights, you can call them wavelengths, you can call them vibrations, that light is going everywhere in this room, you know, every angle, everything.
When you polarize the light, you want to take all that light and you want to put it in one area where only the things go -- only the light rays going in one direction. So, I'm sure everybody here at some point has had polarized sunglasses, that has literally a filter in the glass that only let's light coming straight in. Anything that's at an angle is not making it, and they always use that commercial where they're looking at a pond or something and you put the polarized light on, now you can see the fish in it because you're taking that light scatter out of it.
So, for a polarized light microscope we have two polarizers. They call it the polarizer and the analyzer. One below the stage, one above the stage, and we put those in various positions during the entire analysis. Sometimes we're only putting one in, and if we're going to do cross

Page 179

polars, we put two in.
Q. Okay.
A. So now we've got light going this way, you know. So, that's the whole thing with polarized light.
Q. We going to get to discuss it in a little more detail in a second. But safe to say the methodology that you follow to reach the point where you make your opinions is a standardized methodology, correct?
A. Correct. It's -- the preparation of the polarized light sample hasn't changed in eons. You know, the refractive indices fluids, some people call them oils but they're really fluids, they're organic molecule, and that hasn't changed for years. What has changed is the sophistication of the equipment where you can get better resolution, better things here and there, but we're not doing anything that hasn't been done years and years and years for analyzing.
You know, our laboratory has analyzed well over, I believe now, 400,000 asbestos samples using polarized light microscopy. Our analyst, especially Paul Hess, he's been working for us for over 30 years. He was actually trained by Walter

Page 180

McCrone. So, we have very good analysts and very good scientists.
Now, what's different is when we're finding a difference in the refractive indices that's not normally seen for chrysotile in Canada.
Q. Right.
A. But that's not any of the methodology. That's -- that's the crystalline structure.
Q. Right. We're going to get to that and the significance of that.
But, in short, the methodology that you perform to analyze talc by PLM, polarized light microscopy, involves two parts. One part is the concentration part and the other part is the actual microscopy part; fair?
A. That's fair.
Q. The concentration part wasn't really a part of this, but I just want to mention it so we have it out there, the concentration part is the part of separating out debris or things that would obscure your field of view from the material that you want to examine; fair?
A. Correct. You want to get rid of as much of the talc plates as you can because the talc

Page 181

plates, there's 95, 97 percent. There may be a million talc plates for every hundred or so amphiboles. So, you have two choices. You can concentrate it where you remove most of the talc, try to remove as much as you can, or you have to dilute the sample so that the talc plates don't stack up in the TEM sample and you can't see through it. It was sort of like, you know, a transmission electron microscopy uses electrons. It comes down this big column, you've got an electromagnetic lens that squeezes the electrons down into almost a point. It goes through the sample, which is carbon film that's 100 nanometers thick which would be about seven or eight atoms thick, so fragile.
And if you've got fibers there, if it's not too think, it will go through the fibers and that's where you get your contrast difference. If you got all these talc plates, you can't see anything. So, you want to get rid of those. You either dilute it, I call it the dilution method but you got to dilute it like crazy where our concentration method for TEM or PLM is thousands of times more sensitive than if you're using the dilution method.
Q. The concentration method specific for

Page 182

analyzing cosmetic talc for the presence of chrysotile, did this originate from a document that was found in Johnson & Johnson's files?
A. Yes.
Q. We're going to look at that in a moment, but the foundational methodology for concentrating, then analyzing by PLM, polarized light, for the presence of asbestos in talc, originates from a 1973 Colorado School of Mines memo to Johnson & Johnson, correct?
A. Yeah. It wasn't a memo.
Q. Yeah.
A. It was the finalized methodology of, they called the double density separation, where they would take the pellet or the amphiboles and we called them the light fraction that's at the top. And the director of the Colorado School of Mines signed it and it was all really fancy. So, they had a method for both, both chrysotile, and amphibole asbestos.
Q. The methodology associated with evaluating by polarized light microscopy for the presence of asbestos in talc is a standard methodology that was actually marked as an exhibit earlier.

Page 183

It's ISO 22262-1, correct?
A. Correct.
Q. And is this the methodology that you utilize in evaluating the presence of asbestos in talc?
A. Well, we used all the behind the scenes type things. You know, what we don't use is their birefringence method, which is looking at the Michel-Levy charts.
Q. Right.
A. We do it the way that you subtract it out 'cause it's more precise other than stating low, medium and high.
Q. All right.
A. 'Cause medium can be this long from start to finish, and low can be this long, so you want to know where it sits, it's low or if it's a high-low type.
Q. So, I'm going to ask you about birefringence in just a moment, but just so we're clear about this, birefringence is a -- is a value that assists you as the analyst to differentiate what is asbestos and what is talc; fair?
A. Fair, what is chrysotile and what is talc. That's the two.

Page 184

Q. Thank you.
This is Exhibit 18, this is the 1973 procedure, the Colorado School of Mines document that you talked about?
A. Yes, sir, because until this document came along, there was the overwhelming feeling that you could not use heavy liquid density separation to get chrysotile out of cosmetic talc, because the density of talc and the density of chrysotile is so close. Chrysotile can be anywhere from 2.55 grams per centimeter cubed, where talc may be 2.60 or 2.66, so that you've got a very fine line of getting one out versus the other. And to make it even harder, the surface charge between chrysotile and talc are different, so it sticks to talc, too. And when you're pulling those big plates down and you've got chrysotile in there, it would be like being in this room and all of a sudden these, these are coming down because it's, you know, they're heavier and they're going to go to the bottom. Well, if you're standing under it, it's going to take you with it. If the chrysotile in there is standing under -- is under, mixed in there, those talc plates will pull the chrysotile down. So, it took a lot of work to work around all that.

Page 185

Q. One of the initial series of questions you received here was about how you had done concentration looking for the presence of amphibole asbestos in talc up until 2019. Was it in 2019 that you became familiar or aware of this 1973 test method?
A. It's either 2019 or -- I think it was 2019 we ran across it. Well, I get so many documents --
Q. Of course.
A. -- from all this. When I went through it, I saw what it meant.
Q. Right.
And what it means is that as far back as 1973, there's been a methodology known to Johnson & Johnson whereby talc could be separated from any chrysotile inclusions and analogs, correct?
A. As well as amphibole asbestos, in this case, tremolite, anthophyllite. So, the question you have to ask yourself, if there's no asbestos in these mines, why spend a year funding a really good talc -- I mean, really good mineral research center to make a method to find something that doesn't exist?
Q. These are just the standards, ISO I

Page 186

think they actually are included, but your methodology --
A. It's not my methodology.
Q. I'm sorry. The methodology for analyzing for the presence of chrysotile in cosmetic talcum powder, does it include following ISO 22262 with the heavy liquid separation followed by PLM analysis?
A. Correct.
Q. Does it include a recognition of a document that we're about to look at from McCrone 1974 stating that the color or wavelength of chrysotile will vary by region?
A. Yes, I've seen that.
Q. Does it include using a standard for asbestos to compare what you're seeing under PLM?
A. In this case, the same thing we did, Calidria, chrysotile standard. Now, these were not -- somebody will ask you, is this an official Government standard?
Q. It's not.
A. No. No. In a research lab or any laboratory, standards are typically made in the lab, organic chemistry, whatever. And you can't buy them off the shelf. I mean, to buy a standard for

Page 187

chrysotile, you can only buy chrysotile, tremolite, anthophyllite, grunerite, also known as amosite, et cetera and that was from NIST and they don't even sell it anymore. And that's it. Those are the standards you can buy. If you get a standard saying, like, I've got a really different kind of chrysotile here, maybe I'll buy Union Carbide's SG-210, forget it. We just happen to have it from a previous case.
Q. Is the methodology that you're employing also involve calculating what's referred to as birefringence in accordance with published protocol?
A. Yes.
Q. The methodology associated with PLM ISO 22262 involves analyzing the color, the refractive index, the birefringence and the morphology of a particle to determine what it is that you have; true?
A. True.
Q. Can you tell us a little bit, just about how color and refractive indices are related and how they're analyzed?
A. Well, refractive indices is always a 1 point something, and the definition of it is

Page 188

literally the speed of light going through a vacuum as compared to the speed of light going through a glass of water. Because you have water in there, it slows that light down.
Ah, the good old pencil. This is one I like to use because the light going through the water is being slowed down, so you're getting refractions at a different angle. That's why that pencil looks like it's been broke and on the top. So, that's because the -- the refractive indices or the speed of light from the top, you're going to go through the glass that's going to slow it down a little and the bottom with the water always changes what you're looking at.
So, this, this water has a different refractive indice than air. If it was -- if you filled this thing all the way up to the top and had that pencil in there you wouldn't see any bend in it because now the pencil is in the entire area where the refractive indice is going to be the same, whatever it is in water.
Q. Okay.
A. So it's a very complicated subject. I told people in the past, including Mr. Dubin, that TEM was a lot easier in concept than it is talking

Page 189

about light going through crystals and changing their angles when it comes out of the crystal.
Now, in order to change its angle when it comes out of the crystal it has to be known as biaxial crystal. So, chrysotile, talc, all these, that's why you get a parallel, a parallel refractive indice because that is one angle coming out of the crystal, and then perpendicular is the other angle coming out.
So when you turn it on the stage from parallel to perpendicular, it's two completely different rays and that's why you get the color change.
Now, you get one that's not biaxial, you can swing it around the stage and the color never changes because it doesn't have two refractive indices. It's got to have two, and there's no birefringence when it doesn't do anything.
Q. Okay. Different particles or different crystals will have different refractive indices?
A. Yes. It's a very easy method and a lot has been done over the years since it's developed, you know, in the '70s, to be able to identify minerals, not just asbestos but any kind of

Page 190

mineral that's not opaque.
Q. Fibrous talc will have different refractive indices, correct?
A. It will. They're much further apart. So, people have asked me what's birefringence. It's typically something where you're going to get a very similar color that you're going to see sometimes in one mineral versus another. But in order to have birefringence, you've got to have two rays coming out.
So, you know, these lights up here, we'll kind of pretend that's -- and you can see the kind of color it is. If you had much higher power lights and you had a dimmer, you take the dimmer and you move it down low, you're going to have one intensity coming out of those lights. Then if I raise that dimmer, I'm going to have a second intensity coming out of those lights, but it's going to be more intense and that's what you measure on the birefringence.
If you don't have a biaxial crystal where you are getting two angles being refracted out of the crystal, you'll never have any birefringence.
Q. Okay.
A. Nothing to compare it to.

Page 191

Q. This concept of evaluating color and refractive indices, are these related in how they're evaluated? Basically when you look at a particle under a polarized light microscope, does the color indicate attributes that relate to its refractive indices?
A. It does. You'll have a certain range that is expected and then you'll have certain ranges that were not expected.
Q. Right.
A. And then you have to look at it over and over again. So, you're getting the wavelength. Wavelengths are measured in nanometers, I believe, and it's a wave, just one wave. And these waves are smaller or longer. And the colors will depend on that. So, it's -- then you look, and then you can go to a chart and look it up and also base it on your experience because you notice those charts, they kind of not blend very well. If you look at an electronic one, you get a blending in there because it's not always just what you see, well, this is where purple is. It's got to be purple.
Q. Right.
A. It's not. You can have a mixture in there that could gives you something a little

Page 192

different. And that really comes with experience in doing this type of work.
Q. My wife took that picture. I just liked it. As far as refraction, I thought that's kind of -- not important.
A. Ah, there you go.
Q. You mentioned polarized light earlier. Is this just kind of an example of the polarized light or polarized light microscopy?
A. Yeah, you're not getting all the scatter off the water like this and now you're just seeing the ones that are coming straight at you literally, and it filters out the rest of the stuff and that's what made it famous.
Q. So, when you talk about directions of light, like parallel and perpendicular, like you did with Mr. Dubin, are we talking about taking a sample, and this is just for demonstrative purposes here, but taking a sample and shooting a beam of light through it in a particular direction and then rotating that same sample?
A. Right, this is all in one direction and when you rotate it, you are changing the angles of that light coming in. It's like you're looking at it in a different angle. Rainbows, you see a

Page 193

rainbow out there, you might see a blue and a green, maybe a yellow, but somebody 30 miles away looking at it at a different angle will probably maybe see just only red and a little yellow. And that's from the microscopic water droplets in there causing a different reaction. So, it's always -- it's about the angles and since this is a biaxial, when we turn it perpendicular, you're getting this change in the chrysotile.
This is the 1866 standard.
Q. Yes.
A. And we're using 1.40. So, we're using a lower refractive indice -- excuse me, a lower oil, and what we have is, as I said earlier, it shifts it to the left as you go lower in the RI fluid 'cause normally you're not going to have a bundle this size, which was 434 microns, be yellow.
Q. Sure. And I really just wanted to use it to kind of illustrate the point but this fluid that you're talking about, whenever you analyze anything in polarized light, you have to have a fluid to slow the speed of light going through the sample?
A. Correct.
Q. Okay. So --

Page 194

A. And you need a fluid that is in the range of what you're looking for.
Q. Right.
A. 'Cause if it's not, you'll never get the right -- the right type of refraction.
Q. So, parallel is called gamma sometimes, and perpendicular is called alpha?
A. Alpha gamma.
Q. Right.
A. Scientists love it.
Q. So, when you were talking about subtracting this value from that value and there was the gamma and alpha, really what we're talking about is what is measured when analyzed perpendicularly to the fiber and then when it's been rotated -- I'm sorry -- analyzed parallel and then when it's been rotated.
A. Parallel is always gamma. It's always of the highest refractive indice as compared to the gamma or the perpendicular.
Q. So, just again, so we're not -- we're clear here, you can actually find landmarks in the sample and see that the sample is the same sample, it's just been rotated 90 degrees?
A. Correct.

Page 195

Q. Right?
That's essentially the same thing?
A. Yes.
Q. Right.
A. It's the -- you can see the -- some of the smaller pieces in there. This is not in talc. This is just the 1866b standard where we are looking at different refractive indice oils -- excuse me, fluids, just to see how it affected it and we did the same thing with talc.
Q. I don't want in any way for this -- this is not one of your samples of talc or anything like this, just for illustration purposes.
This is a sample of the NIST 1886 chrysotile in perpendicular. Can you tell us about the significance of the different colors and the different refractive indexes that are indicated here?
A. Well, this came up when it was suggested that it had to be always magenta, you know, the 1. -- you know, the 1.558 or approximately, but if you look at these bundles closely, you can see other colors in the chrysotile. So, what I did -- what we did is we just went down and said, okay, right here it's 1.538. Right here

Page 196

it's 1.552, which is what it should be probably. Over here it's 1.540. So, you're not getting this uniform -- uniform refractive indices and you can see where it's cranked, so you are getting where the bundle has been bent, and you're getting some of the -- the magenta 'cause you're starting to get close to your parallel.
Q. Is this similar or is this how you analyze those particles in the lab?
A. Yes. This is on the monitor, where we'll have a lookup chart and the lookup chart is not really a lookup chart. It's -- our last auditor for the NVLAP, National Voluntary Laboratory -- you know, Dr. Bo Li, came in, and the National Voluntary Laboratory Accreditation Program is designed for labs that use school samples, both bulk, PCM, TEM, and we haven't done any school samples in five, seven years.
So, this -- this inspector came -- you know, he came there and he said, you know, "You're wasting your money," you know, 'cause we never had anything to show him from the time we used to do school samples except for stuff that was -- had been looked at over and over again. He also had this program, which is like a spreadsheet. So,

Page 197

you could put in the refractive indice fluid you were using, you could put in the wavelength, and you could put in chrysotile, and it would give you the refractive indices. We beta tested it. He gave us that program.
Q. Is your analysis of chrysotile in talcum powder based on you simply picking the wrong color?
A. No. Not at all. I mean, we know the colors are -- has a -- now that has a higher refractive indice in gamma but a lot of times in the alpha or perpendicular, we're getting ones that are pretty close to being in the range. It's the gamma that is -- the refractive indices are higher.
Q. Before I go on we talked about ISO but is using polarized light microscopy to detect the presence of asbestos in material, is this a well understood and well accepted methodology?
A. For bulk analysis, it was one of the first analysis out there for determining asbestos in construction products. So, it's been around. I think we've got our first -- our certificate from the national voluntary laboratory accreditation program back in, I think maybe late 1990s or early 2000s and it is what's done in labs.

Page 198

If you're doing polarized light microscopy and you find asbestos in there, there is absolutely no rule or anything that says you have to go now and verify this by transmission electron microscopy. Those 4,000 samples -- 400,000 bulk samples we've done, maybe a few hundred made it into TEM, like floor tiles, or something along that nature. It has never ever -- once it's positive by PLM, you're done.

Q. And you're done because you have a confirmed presence of asbestos in the sample?

A. Correct.

Q. TEM is not a necessary step confirming something that you've already found to be present?

A. It's not required. I mean, EPA doesn't require it. International Standards Organization doesn't require it. National Institutes of Occupational Health doesn't require it. And the new -- the White Paper Working Group, the working group said you don't -- it's not required. If it's positive by PLM, you're done.

Q. You were asked questions about -- first of all, let's back up here a second.

What we're looking at is a sample in

Page 199

that orientation that was referred to as parallel or gamma, right?

A. Correct.

Q. And what we're looking at is referred to as a NIST 1886 (sic) chrysotile standard, right?

A. Correct.

Q. What is that?

A. That's a standard that the National Institutes of Standards and Technology, it's really 1866 B, and it is chrysotile from the, like Black Lake area up in Canada, essentially where Johns-Manville mined most of their chrysotile. So, this is a very large bundle, and you can see it takes up the whole, from one end to the other here. And it's the same thing we looked at before, and you can see where the little creek is that now it's closer to being perpendicular than parallel, so you are starting to get the blue in there.

Q. So, when you were asked these questions about color charts and wavelengths, were they based on this NIST 1866 standard?

A. The 1866 standard is something that we have used many times but what we used it for initially is to help train new PLM analysts because for asbestos-added products, it's all pretty close.

Page 200

Q. Is it a good standard for detecting asbestos in talc?

A. No.

Q. Why?

A. Because, one, it's just the size of this. If you go down and see some little yellow or red things, that's the size we're dealing with. This is huge. So, you can't. And it has a certain set of refractive indices that are lower than what we're seeing in both the -- in the cosmetic talcum powders -- I mean, actually, it's higher -- and in what we're seeing for the Union Carbide, what I call standard now.

Q. Okay. Is it understood in the published literature that different sources of chrysotile do, in fact, have different refractive indices?

A. Yes.

Q. This will be Exhibit 29.

Do you know of this publication by Walter McCrone?

Let's take a moment here and stop. Who is Walter McCrone?

A. Dr. Walter McCrone probably -- if I say there were two PLM analysts that did the most

Page 201

research, it would be Dr. Su back there on PLM, as well as Walter McCrone. You know, Walter McCrone was the guy who they let go analyze the Shroud of Turin. He came in and said it was false, fake. I don't think that went well to the people that hired him.

So, here's one where he talks about -- now, the thing is that these are mine samples meaning these were not out of a container, they have not been milled, et cetera, but you do get a range starting from Quebec to Ontario, and if we get down here, where is it, California, Coalinga. We get a 5.90 and a 6.3. If we go up to California Pacific Asbestos Corp. right above it, you get a 5.9 -- I mean a 4.80 and 4.80 is getting into yellow -- I mean, 480, excuse me.

Q. Thank you.

A. Not 4.80.

Q. Is this an indication that chrysotile, depending on where it comes from, will have different wavelengths from other mineral -- mineralogically identical chrysotile?

Wait a second, that's a terrible question. Let me just pull that one back.

A. Okay. I was going to fix it for you.

Page 202

Q. Thank you, but I screwed that one up.
Is this chart a reflection that as far back as 50 years ago it was recognized that chemically identical chrysotile will have different refractive indices depending on where they come from?
A. It does. Some will say, you know, if you have some iron in the chrysotile, which you see, it can change it, or there's other kinds of minerals in the crystalline structure.
Ours got changed -- what we were finding, you know, I think the lowest one here is five -- is 480 for the gamma and I think that what we were seeing a lot of times was in the 420, 430 nanometers.
Q. There is a -- there is support in the literature published by Walter McCrone that there's a variation in wavelengths associated with different types of chrysotile?
A. From different mines. And this is before they had been milled, so this is like right out of the ground.
Q. Um-hum.
Dr. Su, it is actually defense Exhibit 11, our Exhibit 22, published in 2003 with

Page 203

this chart. Does this chart also reflect that there are different wavelengths for chrysotile?
A. Yes. These would be the ranges from top to bottom, the very highest to very smallest. You have seen in -- where is it? This is gamma -- you have seen for alpha some down in the, at least in the EPA, I think we got one as low as 1.538 or so when we looked at that chart. But what we were finding is it was in kind of a small area, such as, you know, from 440 down to about 500. So, it was a space up at the top there. 1.560 is, I would say, you know, primarily the lowest we would see, and 1.570 or 71 would be the highest.
Q. Regardless of the range, there is a range in the literature published by respected scientists that chrysotile will have different wavelengths or different refractive indices depending on from where they come from?
A. Right. The chart we just saw had 480 and a little bit lower and that has a range of 1.563 at 21 degrees Centigrade and 1.561 has been said that's impossible for it to be chrysotile. Well, Walter McCrone found that a 1.521 degrees, I think we had a 480 wavelength and that corresponds at 21 degrees Centigrade, 1.563, and that's out of the

Page 204

range for gamma according to ISO, according to that chart for determining if it's chrysotile. And this is -- these are refractive indices or wavelengths that Walter McCrone has published.
Q. Exhibit 23 is another paper from Dr. Su. This is one of the ones from 2022. The quote here is that, for example, there are chrysotile minerals whose refractive indices are significantly higher than those of the standard chrysotile from the NIST SRM 1866 set.
I'm going to stop there for a second. The NIST 1866 set, that's this guy, right?
A. Correct.
Q. So, Dr. McCrone -- I'm sorry, Dr. Su is writing that there are chrysotiles whose refractive indices are what he characterized as significantly higher than the standard chrysotile?
A. That's what it states here.
Q. Is that what you have come to find with the chrysotile that you found in cosmetic talcs including Johnson & Johnson?
A. Yes. Typically the gamma is in the 1.558 or 1.556 range for gamma. We're seeing in some rare occasions 1.559, but it's mostly in that lower range. What we're seeing is 1.560 up to

Page 205

1.570. So, it's -- it's essentially -- well, I don't know the percentage higher, but it's the next row.
Q. But -- I'm sorry. Are you good?
A. Yes.
Q. Okay. But Dr. Su says and the next sentence is, "In that case 1.555 or 1.560 instead of 1.550 refractive index liquid should be used to determine the gamma."
Do you see that?
A. I did. When I read this, that's when we changed.
Q. Okay. This paper was published in 2022?
A. Mid quarter. One of the reasons we changed was this, and then we had a couple scientists said that we needed to use 1.560 in order to verify that it's chrysotile.
Q. Okay. So, would you -- I mean, would you view this as modifying -- modifying how the methodology is implemented to account for different suggestions that have come to you through published literature or suggestions from others?
A. Well, the basic methodology doesn't change.

Page 206

Q. That's exactly right and that's what I was --
A. How use the microscope, how you determine the refractive indices, how you turn what they call the elongation, the morphology of it. The only thing changing here is the suggestion they use another type of RI oil, and it makes sense 'cause if you're seeing things in the 1.560 up to about 1.570, you get more precise analysis with the 1.560 and, you know, and I'll probably change one more time to get 1.565, which will be right in the center of all this. But, Dr. Su hasn't put a table together 1.565, so maybe he will or I'll have to do it.
Q. You have published a paper that will be Exhibit 10, but, looking at the refractive indices of chrysotile structures associated with Union Carbide's SG-210 Calidria asbestos, correct?
A. Correct.
Q. I want to be clear about this, Calidria, and this was covered a little bit, is just a tradename?
A. Yeah, it's chrysotile and it's a product of Union Carbide, so they had various grades. I think the SG-210 was the smallest size grade, and in order to get to SG-210, of course,

Page 207

they had to do some milling of some sort to get it to that smaller size. Then they have other, other sizes that are fairly large.
Q. SG-210 chrysotile is just generally thought of as being a, quote/unquote, "short fiber chrysotile"?
A. It depends on how you define "short."
Q. Of course.
A. If we compare the SG-210 which we'll see the data here, the average length was 10 micrometers. The RG-144 the average length was about 70 or 80 micrometers, and, you know, we've seen others that are even higher than that.
Q. Let's be clear about this, you are not suggesting that Calidria, California chrysotile asbestos ended up in Johnson & Johnson's products?
A. No, not at all.
Q. Okay.
A. It's, you know, what is the -- you've got to start looking at what is happening here that takes SG-210, chrysotile, put it into where you have similar characteristics what we're finding in the chrysotile that comes from cosmetic talcs, that have been already milled in like minus 200, it's got to be the size for it to do that.

Page 208

Q. So, I want to look at some pictures that are specific to Calidria, okay, but as we go through them, I want to real clear for this first set of pictures that what we're looking at is asbestos.
A. It is chrysotile, it's the SG-210, the first set of pictures we have.
Q. Is part of your analytical methodology here comparing what you eventually find in cosmetic talc powders to a standard, a standardized known this is asbestos and this is what it looks like?
A. Correct, we -- like we took RG-144 and it has both large and small in it, and we took it and we spiked talc samples, starting at I think like .1, .001, all the way down, where we got to the point like .00001, and how many Calidria structures were in there. Well, one.
So for us to be able to say at these low concentrations we know that if it has -- if we see a certain amount, we know it's 0.001. We're not doing a volume estimate. That would be impossible with these sorts of things. We're validating it. And now we're doing it again, the whole row with 1.560, and using it -- so this is RG-144 by itself.

Page 209

Q. Right.
So, what are we seeing here?
A. Well, you're seeing refractive indices in 1.550. And we have one, two, three, four structures here. This is the RG-144, so it's longer. You've got the 80 micron long ones, the 54 microns, and we got sort of a reddish, you know, a reddish color on these that are ranging from 1.554 to 1.562 and that's two different colors. Then we come over here to this other one, that one is 1.564 to 1.574, so much higher. And then we have one down here is 22 microns. Again, this is the RG-144 and it is much bigger --
Q. Right.
A. -- than the SG-210.
Q. What is this, the next slide? This will be part of Exhibit 10, part of that same report.
A. This is SG-210 Calidria and it's in a 0.5 percent talc sample. And we have a refractive indice there of 1.571.
Q. Okay. Is what is shown here in this colored sample, is that asbestos?
A. That's asbestos we're looking at.
Q. Is there any doubt about that?

Page 210

A. There's no doubt about that.
Q. When we look at something that's in this purple background, is this often referred to as a -- what is this image referred to?
A. It's known as elongation. So, in that 45-degree angle there, you should have mostly blues. This -- this is kind of a thick structure here so it's -- it's giving us other colors.
Q. Does the elongation allow you to determine the rough morphology of the structure that you're looking at?
A. Not too much. We'd like to go to the next one.
Q. I don't have the next one.
A. Oh. If you can, you have to look at the ends. This one looks like it is a little bit flexible but on cross polars and no polars, you can see the fibrous structures better.
Q. Okay. But regardless, the point of this image is PLM does give the analyst an opportunity to evaluate the morphology of what they're looking at as well?
A. Oh, sure. You're dealing with things very well so you're not going to see your usual splayed ends. But if you've got a steady hand,

Page 211

which I don't, you can slightly roll the cover slip and cause it to spread out.
Q. Okay. This is another example of the SG-210 that you looked at.
A. Yeah, here we have it in 1.560 and we have 1.570, which is going to get us down in the 1.4 -- excuse me, 1.5 -- never mind. Like the 460 or the 440 wavelengths. Then you get the yellow.
Q. Okay. This color, and this is an example of asbestos that you found under the polarized light microscope, correct?
A. Correct.
Q. What about this sample here?
A. Same thing. This is a smaller one. It had a range of 1.564 to 1.570.
Q. This sample was mounted in what's referred to as bentonite clay. Why was that?
A. Is this the one?
Q. Yeah.
A. Well, we wanted to put -- bentonite clay does not have talc in it. It's not formed that way and bentonite clay is pretty pure. You may have some odd things in it. So, we wanted to put the SG-210 in the bentonite clay matrix and then analyze it. Nobody could say, oh, you are misidentifying

Page 212

fibrous talc because we're in bentonite clay.
Q. One of the things that's often said about what you're finding here is that it is just fibrous talc; you're aware of that, correct?
A. I say?
Q. You're aware that other people say this, Johnson & Johnson and their advocates have said that what you're finding isn't asbestos but rather fibrous talc; you're aware of that, right?
A. Every trial I'm in.
Q. Sure.
Is talc an accessory mineral to Calidria asbestos?
A. No. There's -- we've never seen any talc in there and Mickey Gunter actually testified that there was only a few things in there, and he said talc was not one of them.
Q. This, the samples that were taken mounted in bentonite clay, I shouldn't say singular sample, there were several samples that were analyzed, that medium did not have any talc in it, correct?
A. Not bentonite clay, no, it's a completely different formation I've been told by the geologist.

Page 213

Q. Is there any question in your mind that what's represented her in the polarized light is asbestos?
A. It's asbestos. It's in, you know, 1.550. We're seeing, quote, the yellow, and that was a yellow gold and that is not chrysotile, and here I don't think anybody could argue that, quote, we don't have the -- we don't have the -- we don't have the intensity of the light all turned on. I mean, it's all white because it's reacting with the light we have there.
Q. I'm sure you can modify the color in any kind of software but that's for a different time.
You just said that is not chrysotile. I --
A. I said that?
Q. You did say that.
A. I screwed up. That's not talc. That is chrysotile. We put chrysotile in there into something that didn't have chrysotile or talc in it.
Q. These transcripts live forever, as you're aware.
A. As I know.
Q. This is another image from the same

Page 214

bentonite clay sample. Again, what are we looking at?
A. We're looking at the same thing we saw before. We're looking at -- we're looking at Union Carbide's chrysotile SG-210, their size, and this one's bigger and you can see the yellowish gold. You can see the lines down it. And same thing, we're seeing the same thing.
Q. Is it methodologically proper to compare what you find in an unknown sample with a know sample of something that you previously analyzed?
A. Yes, if it's matching up to what you're previously analyzing, where you have the Union Carbide chrysotile shows you both size, and in the ranges of refractive indices that we're seeing with this other sample. Not that it's identical, you're never going to have identical from one to the other to the other. It just doesn't happen. You're always going to have a PLM analyst who's going to say, well, "I believe that's 1.564," you'll have another one go, "I believe that's 1.566," and I go, "All right. Put on boxing gloves."
Q. This is just another image from the same set. This is essentially the same thing that

Page 215

we've previously seen.
A. Again, this is in 1.550, we're in bentonite clay, and there is no talc in here. And if you look at the one on the right, those refractive indices are not even close to what you would need to make the talc. I mean, the one on the left. The one on the right is what's interesting. When you start increasing the magnification by using a copier, you're rearranging the spots on there, meaning the color spots and making them go out. Nothing's been done to this other than to increase the size and you can see it distorts it and it gives you a little bit higher refractive indice when you start moving the pixels around on these digital photos.
Q. You mentioned Mickey Gunter a couple of times. Mickey Gunter testifies for defendants in these cases, including for R.T. Vanderbilt and some others.
A. Yes, he does. Dr. Gunter does testify on behalf of defendants in this litigation.
Q. Including Clubman Talc, which is a cosmetic talc brand?
A. Correct.
Q. Did Mickey Gunter look at the same

Page 216

Calidria samples that you were looking at and confirm what you found is accurate with what he found?
A. Yes. We were ordered to send the RG-144 and the SG-210 to Dr. Gunter so he could analyze it. And here's his sworn testimony stating that the CDSD (sic) means the central stop dispersion staining. Central stop is a little device right in the microscope where light coming straight up is blocked, centrally stopping it, and because the angles are going around it, and you want to keep that light out. So, whenever you see CSDS, it's just central stop dispersion staining and he found what we found.
Q. Specifically, that chrysotile --
A. They range from blueish to golden yellow.
Q. The refractive indices for chrysotile can and do occur higher than the NIST 1886 standard that is used in the -- I'm just going to say in the tables?
A. Yes. You don't see golden yellow in the NIST standard. You see the magenta, and, again, we're talking about the big bundles. So, it's not the same.

Page 217

THE COURT: To be clear, this is limited to Calidria asbestos?
THE WITNESS: Yes.
THE COURT: Okay. Just want that clear on the record.
BY MR. BRALY:
Q. Calidria asbestos is just chrysotile, it's just a brand name for chrysotile?
A. Yes. It's got to have something to distinguish it from other people's chrysotile.
Q. Right. It's not a scientific term. It's a marketing term?
A. No. Start with C, California, what that area is called there, and I used to know it pretty well, but...
Q. New Idria?
A. Thank you.
Q. So, it's just a portmanteau of California and New Idria?
A. Correct.
Q. It's a marketing word?
A. That's it.
Q. Right. But what we're looking at is chrysotile?
A. This is all chrysotile coming out of

Page 218

that Coalinga mine, not anything else.
Q. Have you analyzed how that standard of chrysotile compares to what you found in Johnson & Johnson's Baby Powder?
A. Yes.
Q. I have -- let me stop here for a second.
You have analyzed many, many Johnson's products by polarized light and by TEM, correct?
A. Correct.
Q. So many so, that if we were to go through every single example of every single one, we would be here for quite a while; fair?
A. I think we're up to 177 individual samples of Johnson & Johnson's Baby Powder, along with Shower to Shower.
Q. You have also analyzed other cosmetics manufactured by other companies?
A. That is correct.
Q. By PLM, correct?
A. Correct.
Q. I just want to look at some of the examples of what you found in Johnson's Baby Powder.
You looked at the sample from the

Page 219

Valadez case with Mr. Dubin for a while. I'm going to show you some other photos from the Valadez thing that you weren't shown and I'm going to show you some of the other samples that you also weren't shown. Okay?
A. Okay.
Q. The first one, this is from the Hope Klayman sample, this is from March 11, 2022, this is for identification, project number M71262. And this will be Exhibit Number 9.
As it relates to color and wavelength that you're seeing here, is this similar to what you found with the California chrysotile?
A. Yes. In this case it's on the little bit lower end 'cause we don't have quite the yellow in it. But it's 1.561 to 1.565. This is where most everything fell in. The California Coalinga or Calidria, as well as what we see and then you'll get 1.565 up to maybe 1.570. It's fairly standard reproducible for the same type of refractive indices.
Q. And then the large, kind of boulder-ish platelike objects, down in the lower right, do you see those?
A. I do.

Page 220

Q. Those are talc, correct?
A. Correct.
Q. And the birefringence calculations will help you determine that, correct?
A. Well, these are platy talc.
Q. Right. I'm sorry. You're right.
A. And you have some white areas on them. That's where you're past, you're getting back to white light. So, the highest that your wavelength would supposedly go with color is about 400, and then you're into white light.
Q. What I was trying to get at, I suppose, is the birefringence calculation in combination with the color and refractive indices helps you confirm methodologically what you're looking at is asbestos?
A. Correct. In order for that to be talc right there, you would have increase the intensity about tenfold.
Q. We'll look at some examples of it.
A. Okay.
Q. You also look at the morphology and while this is the elongation photo and not the cross polars, did you evaluate the morphology of the particles that you were looking at?

Page 221

A. This is where we have some of the errors in the calibration. That should be 2.5, 400X I think it is, 'cause this fiber is not 20 microns long. It's shorter than that, but that's all right. It doesn't change anything.
Q. Are you saying the measurement bar is off?
A. Yes.
Q. Okay. But you did evaluate the morphology of the particle?
A. Yeah, we looked -- you know, this, again, is elongation and we like to see that the ends that you have some fibrils sticking out. So, we look at that. And also in cross polars it shows pretty well and no polars. So, you are basically looking at an image with no color to it.
Q. We'll be sure to change that for the next presentation.
A. That's all right.
Q. And then you also calculated the birefringence of the sample, correct?
A. Correct.
Q. The birefringence came back at a value of .009 which is -- I mean, it's a unitless number, right?

A. Correct, it is unitless. That would be on the very tip of small low.
Q. Right.
A. And then we have 0.014, which is higher, but that is still in the low end of the medium and you can find references to actually higher than that in the EPA R-93 PLM method on figure 2.2 on page 19.
Q. So, the birefringence calculation, which we're going to go through later but it establishes what we're looking at is not talc but asbestos?
A. It's chrysotile.
Q. Yes.
This is another sample from the same report, the Hope Klayman sample, this is just a different photo of the same thing -- I'm sorry, this is another found -- what am I trying to say?
A. Chrysotile bundle.
Q. Yes, thank you. But it's from the same report?
A. Yeah. It's a different -- you know, a different sample from the same sample.
Q. Right.
A. Meaning it's still sample one and

this would be the fourth one we found.
Q. And, again, the same color, the same refractive indices, or not same but the same range as compared to the California chrysotile sample?
A. Yeah, here we have 1.566 to 1.569. So, we're on the other end of what we see.
Q. It has a morphology that is consistent with chrysotile?
A. So we have a little thicker area here on the very end. Sometimes that can be talc.
Q. Okay. But we have the birefringence calculation which eliminates that possibility, correct?
A. Well, it doesn't eliminate the possibility that we have what's known as, you know, the -- a inner -- inner --
Q. Intergrowth?
A. Intergrowth. Thank you.
Q. Yeah.
A. Where you have over the metamorphic process that chrysotile will slowly metamorph into fibrous talc, and this one has it on the very tip, that you have this high yellow and makes me think that quite possibly, and then we have this bright blue on the blue -- on the dark blue background in

just that one area and then the same area here where we have this real bright yellow and then a not so intense yellow for the rest of it.
Q. Okay.
A. So, looking at this, I would say there's a 95 percent chance that's an intergrowth with both talc and chrysotile and you notice that it's only on one area of it. We have other examples that show when you have a half and half, half chrysotile, half fibrous talc and what the difference is in the birefringence.
Q. Geologically it is possible for asbestos and talc to grow together, correct?
A. Well, it's not growing together. They call it a metamorphic process in which over many, many years, and there's a paper out by -- he published it in Science, Veble (phonetic), in which he did high resolution TEM where he cross-sectioned it and he can show the chrysotile scrolls and then it goes into talc, and sepiolite and something else it was pretty good work.
Q. Can you tell from this analysis, what we're looking at here is predominantly chrysotile with something likely talc on the very end of it?
A. That's my opinion about this.

Q. Right.
It's interesting because one of the criticisms that we heard is that your lightbulb or the light that you were looking at or the light that you were using to analyze the stuff could not differentiate between talc and chrysotile. Is that true?
A. Oh, that we didn't have enough high intensity?
Q. Right.
A. Well, this is under the same intensity. We don't have a light source that you can just put it right on the tip of the chrysotile bundle and turn it to that. That's under the same conditions, the same background, same everything and you can see how much more intense that is on the end, and that's where the talc is.
Q. Okay. Again, this is from report M71643, dated October 19, 2023. This is an analysis of a 2004 purchased bottle of baby powder, and this will be Exhibit 11.
In 2004, do you understand that Johnson & Johnson's Baby Powder was utilizing talc source from China?
A. 2004?

Page 226

Q. Yes.
A. Yes.
Q. Okay. Tell us about this image with respect to the color and refractive indices and what you found in comparison to the asbestos standard that we looked at before?
A. Well, we get a refractive indice of 1.566 and this is in 1.560, and we have sort of a dull yellow and a little gold. So, 1.566 is a good match for that.
Q. Morphology consistent with asbestos chrysotile?
A. Yeah, at the very end you can see some fibrils, and I keep saying cross polars and no polars, but, again, you're dealing with -- here's one that has the right 2.5, so the other one would have been 25. That's a 25-micron bar and so that makes that chrysotile bundle maybe three or four microns long.
Q. This is from that same report, 16 -- 71643. This is just another example of the same thing.
A. Yeah, you have some talc plates sticking to it. But the same thing.
Q. Right.

Page 227

A. 1.566 to 1.569 and you can see that it's thick in these areas. That's why you get some that's different colors there, because of how thick that particular bundle was, and you can see at the end of the bundle that we have some individual fibrils that are kind of sticking out there.
Q. Okay. Birefringence calculation for the four samples that were taken out of this report, .005, .009, all the way down, are those consistent with asbestos, with chrysotile?
A. It's in the range, again, that the EPA put out, which is .004 to 0.017. So, you're in the low range. These are all in the low range as compared to the one high range of 0.017 -- excuse me -- in the one medium range but on the low side.
Q. If this were talc, would you get birefringence calculations as well?
A. Well, it wouldn't be these calculations.
Q. Right.
A. Because I think the lowest we've ever seen in talc for a birefringence was 0.045. So, you're essentially five times higher here but usually they end up in the 0.050 to 0.055 and occasionally 0.060.

Page 228

Q. Okay. So, many, many, many times higher than the birefringence values for chrysotile?
A. Correct.
Q. This is the Jeanine Henderson bottle. This is report M71730 taken November 28 of last year, 2023. Again, are we finding a similarity between the referenced asbestos and what is found in the baby powder?
A. Yes. In here we have 1.566. I think it has little pieces of talc still on it, when sometimes these come apart from the plates, so --
Q. In fact, we see that here?
A. Yeah, you have fibrils on the bottom, but it has a thick area up at the top of this.
Q. This was the same report, different image or different particle.
A. Yes.
Q. And what is that kind of discrepancy that we're seeing there on the left?
A. I believe that's where you have intergrowth of talc. Sometimes we can map it out and show it, sometimes we can't.
Q. So, the methodology that you're using can distinguish between what is asbestos or chrysotile and what is talc?

Page 229

A. Correct. What we're looking at here in 1.567 is that non-bright area. And you can see that it's a little thicker and sometimes you'll have things that look like this.
Q. Okay. And, again, did you follow the process or the methodology of calculating birefringence to confirm that what you were looking at was chrysotile asbestos?
A. Yes.
Q. This is the Valadez report that is in the defense -- well, let me take that back.
This is part of what was not included in what the defense offered as an exhibit. This image comes from the Valadez report --
MR. DUBIN: I'm going to object. That's not accurate. We did discuss this.
THE COURT: It is already part --
MR. DUBIN: Yeah, we did discuss it.
THE COURT: I think it's a different image within that report.
MR. BRALY: It's a different image. This is what you gave me.
MR. DUBIN: I don't know what you're referring to.
MR. BRALY: This is the Valadez.

Page 230

MR. DUBIN: This was in our slides. Valadez will always be brighter. That can't be Valadez.
MR. BRALY: You're right. I was holding up Zimmerman.
THE COURT: Just rephrase if you're going to use that one. It really doesn't make a difference.
MR. BRALY: Yeah.
BY MR. BRALY:
Q. Regardless, how does this compare to what you had found with the asbestos staining?
A. It's right in the range. Again, this is a 1.568 versus a high 1.57 or 1.71. I would say 95 percent of what we see is between 1.560 and 1.569.
Q. Okay. Again, we can go through the rest of this but you followed the same methodology for all of these, right?
A. I did.
Q. What I want to make clear about this is when you take a sample of Johnson's Baby Powder or any other cosmetics product to analyze by PLM, do you follow the methodology that's been routinely accepted by scientists and has actually standards

Page 231

associated with it?
A. Yes. We're doing the same thing, that same method over and over. We're in the debate or argument or, you know, you may disagree on the refractive indices or where those refractive indices -- do they belong to chrysotile or not. And our opinion is that this chrysotile that we're seeing in the cosmetic talc, it does, because that's what we're seeing and we get the same thing with the -- with the, you know, the R -- the 210, same thing, same kind of ranges. You can't show one and go, well, this one's a 1.563 and over here we have one that's 1.567 and they're different. How can they be different? They're not different. They're in this range. And you're always going to have -- the analyst is going to give you what he thinks that range is. But it's always in that range that we're seeing.
Q. Is the methodology, the process of doing testing by this method reproducible?
A. Yes.
Q. Have you reproduced it many times?
A. We have.
Q. Before we go on to the section about chrysotile in talc and intergrowths, because I've

Page 232

got some more images that I want to show you related to that, you were talking about the white color being -- for the Tungsten bulb being yellowish or something like that.
A. It's no different than that.
Q. Right.
A. It's incandescent. That has that in there.
Q. Are there different shades of white?
A. You ever go to Home Depot and look at the light section, there's about 50 of them in there? Yes.
Q. You were asked about white balancing. Does your PLM analyst in the process of analyzing by PLM do what's called a white balance?
A. It's done all the time and you're also lining up the beam in the mornings, so that it's coming all the way through and you're adjusting your objective -- you know, you're adjusting the diaphragms to get that light in so it is just over where you call -- what we have is the central stop. This is really like a aperture. And you want the light not to go over that -- I mean, go into that. So, you do take care of that microscope, get the best out of it.

Page 233

Q. What I want to ask you about is -- this is going to be Exhibit 16. This is photographs that you've reported on showing intergrowth, showing asbestos and talc occurring together, correct?
A. Correct.
Q. And you did this, or this analysis was done under exactly the same conditions at the same time, right?
A. Correct. There's nothing different here. So, you've got starting on one end because it's white, that makes it -- that's why we have a greater than sign, 1.585 because that pushes it outside the range that this refractive indice fluid can detect. It's not can't detect but you need to change the -- if you want to know exactly what that is on the left side, that pure white, you can change the refractive indice fluid to be more in line with that.
And then as you get closer to the other end, that's where the chrysotile is. And, you know, you have to pick a spot like 1.558 all the way to 1.565 at the very end. So, you've got intergrowth with talc in the chrysotile or the chrysotile in the talc, however you want to say it.

Page 234

There's no way that I know of doing that where we're only increasing -- increasing the brightness on one side.

Q. Visually, even when we ignore birefringence calculations, visually, are you able to differentiate between what is talc and what is chrysotile?

A. You can tell right away by looking at this, in my opinion, where the talc starts and then it sort of mixes with the chrysotile as it goes down.

Q. This is another example. I have it zoomed in here. This is just a different example of the same phenomenon. Is this something that you've observed again and again?

A. Starting all the way to 2022, we must have 50 of these, both with this microscope, as well as the old microscope that has the Tungsten bulb in it where everything is so bright, quote/unquote, and then you can pick out where that talc is because that's really bright.

Q. This is just an example of the elongation for that sample.

A. Yeah, you can see the intergrowth here where it is. The blue area, that's where the

Page 235

chrysotile is. So, you've got it running down kind of the sides and then at the end. That is -- here's another one where it's just the opposite. We have increasing talc content and then chrysotile and you can see how bright white that very end is. That's because it's in a refractive indice fluid that's not quite -- can do the, that can change the lighting on it.

Q. This one is in that different orientation; everything we've been looking at so far has been in that parallel or gamma orientation, this one is in the perpendicular or alpha orientation, but do you see the same phenomenon here?

A. Well, the refractive indice here for that little area on the chrysotile bundle is 1.538. And if you go back to the other one, I think it was greater than -- one more --

Q. I think that's it.

A. Greater than 1.585, I believe, or 1.59. There we go.

No, well, this is the perpendicular. It doesn't matter.

Q. Right. The point here is just even without doing the birefringence calculation, the methodology allows you to distinguish talc in

Page 236

chrysotile?

A. Right. You can see on the chrysotile, almost just a large fiber, at the very end on the upper right-hand side you can see some of the fibrils of the chrysotile bundle. And then as it makes its way down, you're seeing the interference it's causing with the talc section that mixed with the chrysotile.

Q. Just more examples of the same kind of phenomenon?

A. Yes. Here at the top we have half of it, more than half of it is talc with a refractive indice greater than 1.585. And then we have the chrysotile end, which is 1.564. So, it's a little bit more than half and half.

And the perpendicular, you got around 1.552 -- well, the perpendicular for this we would need it so I can get the exact number. So, here it's greater than 1.590, meaning you're out of the range of what the refractive indice fluid can do to give you colors.

Q. Which is why it shows it white?

A. Yes.

Q. You were shown this image from the Zimmerman report.

Page 237

A. Yes.

Q. Do you recall that?

That morphologically, I mean, it does look different, appears differently than some of the images that we saw from others; fair?

A. That's fair. But you'll get ones that look just like it.

Q. Right.

A. There's a range of what you'll see in structures. It's not all the same.

Q. You were not shown the perpendicular orientation of that same structure, at least not by Mr. Dubin, correct?

A. Correct.

Q. Or this one, which was also the Zimmerman report, that it was not part of the defense exhibit.

A. Here you have talc on the ends of these two structures, and then you have chrysotile on the other side. So, this is -- this is what you will see when you have talc on the structure. Now, this -- the intensity of the light is no different than some of the others, but what's different here is we have the white light coming up from where the talc section is and that's not due to increasing,

Page 238

quote, "the intensity," unquote. If you increase the intensity of this, that white area would be blinding compared to everything else.
Q. You have faced criticism that the chrysotile is really just talc for a long time, correct?
A. Oh, three years.
Q. At least.
A. At least three years.
Q. Exhibit 7 is a declaration that you offered in the Prudencio case where you state that the difference between the refractive indices of chrysotile and fibrous talc is so different that any first-year PLM analyst could easily be able to distinguish between the two elements.
Do you still agree with that?
A. I still agree with it.
Q. It is done by determining the birefringence in chrysotile and fibrous talc, which is the key optical property to differentiate the two methods.
Do you still agree with that?
A. It is. The birefringence between the two, one has a fivefold increase in the birefringence level than chrysotile. The fibrous

Page 239

talc is very high, chrysotile is very low.
THE COURT: Just to be clear, because we're talking about methods, that last sentence go back, yeah, it says, "which is the key optical property to differentiate the two mineral, not the two methods."
MR. BRALY: Thank you.
THE COURT: I don't want someone to be confused about a method some day that might review this.
MR. BRALY: Thank you, Your Honor.
THE COURT: You're welcome.
MR. BRALY: I know that you wanted to stop at 4:15. Maybe I'm rushing just a little bit.
THE COURT: Got it. I mean, we're coming back tomorrow, so wherever you want to end it today.
MR. BRALY: I think I can close but we'll see. I'm bad about estimating time.
BY MR. BRALY:
Q. You further in your declaration break down ranges of low, medium and high for different values of birefringence?
A. Correct.
Q. And that's taken from Walter

Page 240

McCrone's book, correct?
A. It's in the PLM course where it gives you the actual numeric breakdown of what's low.
Q. Okay.
A. And what is moderate and then what is high.
Q. We looked at this a little bit, but the average birefringences for what you found in the various samples, just what we looked at, would all fall into the low range; true?
A. That's true.
Q. Some of these, for example, I don't even know if you can see it, but if you look at like M71614 in the lower left-hand corner --
A. Yes, sir.
Q. -- you were asked questions about whether or not you take the highest gamma minus the highest alpha or whether you need to take the highest gamma minus the lowest alpha.
Do you remember all of that?
A. Yes.
Q. Some of those are just single measurements, correct?
A. Correct. Some of them there is no range, and if there is no range, you just use what

Page 241

you have. But then if you average it versus using the range, you get the exact same thing. So, how's that different if you're just -- if you don't have a range, you just use it as it is. If you have a range, you can average it and when you check it with the range, you're still going to get the same amount. As long as you go high to high and not high to low.
Q. So, this table, this chart, was in defense Exhibit 12, it's our Exhibit 17, it's EPA R-93 document, and this is what you were talking about. It states the birefringence for chrysotile will fall in a range of between 0.004 and 0.017, correct?
A. Correct.
Q. There was a lot of discussion about calculating this range by taking the highest gamma value and subtracting the lowest alpha value.
Do you remember that?
A. I have remembered it for years. Well, not years.
Q. The suggestion was made that what you're doing is artificially lowering the birefringence value of what it is you're finding; true?

Page 242

A. That's been the criticism that I've done it on purpose to make the birefringence lower so I can then justify it being chrysotile.
Q. The contrary position would also be true as well, though, that if that is not a proper method, then the advocates pushing for this position are artificially raising the birefringence value of what you're calculating; true?
A. True, and don't forget, you'll have ranges with talc.
Q. Right.
A. If you use that method, you're pushing the talc down and the chrysotile up. So, let's just do an example here. The very first one, first row is, you have your lowest gamma -- excuse me, your lowest --
Q. Alpha?
A. -- alpha is 1.493.
Q. Right.
A. Your highest gamma is 1.557.
Q. Right.
A. So we take the highest gamma, subtract out the lowest and we get a birefringence of 0.064, which puts you up in the talc.
Q. Right.

Page 243

A. Now, these are chrysotile standards. These are in the environmental EPA book and are referenced.
Now, what has been called my way is taking the highest alpha, 1.546 -- that's the highest gamma. Sorry. 1.557 minus the 1.546.
Q. Right.
A. .546. 0.011, that's in the range where they say birefringence is. If we do it the other way, we had a 0.06. That's not even close to anything chrysotile.
Q. Are you familiar with chrysotile asbestos ever being reported anywhere as having a birefringence value of 0.064?
A. No. That's not the only high one in there.
Q. No, it's not. In fact, if we go through just some of the other -- some of the other examples, if you take the second line, and you took the highest gamma, 1.558, and subtracted by the lowest alpha, 1.532, you would end up with a value of 0.024.
A. I think that's 1.556. Did you say eight?
Q. I'm looking at the second line.

Page 244

A. Okay. 1.556 subtracting 1.532.
Q. Old eyes.
A. Minus 1.532.
Q. 0.022?
A. 0.024. That, again, is not -- that is out of the range, though, usually, say, for chrysotile.
Q. Right. So, can you draw the conclusion methodologically that the EPA R-93 is not using that method because the values they're reporting associated with the birefringence, if calculated the way Mr. Dubin suggested, would not end up with values inside the range that they've reported?
A. Correct. If I now do that second, line how our lab does it, even because other people do it this way, we had a birefringence of 0.007.
Q. Which is in the range?
A. Which is in the range. Doing the other method put it up four times out of the range. Is that right? Almost 28 -- pretty close. And this is not the only place you can find this.
Q. Right.
A. In mineralogy books you see it. There's a document put out by the FDA, when they had

Page 245

their method that they put out in the -- that showed it was going to be done, this method, chrysotile to talc, and same thing, they had chrysotile standards that if you did the method as suggested by Mr. Dubin, it was crazy.
Q. It's not -- it doesn't make any sense --
A. No.
Q. -- when you compare it to known birefringence values for chrysotile?
A. Does not.
Q. Methodologically, is your calculation procedure for birefringence accepted and published -- I mean, published like in this EPA R-93 document?
A. It's accepted.
Q. Right.
A. It's the only way, when you have ranges, that you'll actually get the right number. Unless you have it so close that it doesn't make that much difference.
Q. Right.
A. But, you're staring at it right here. That goes back to the point that the birefringence definition that is in the ISO is just a definition.

Page 246

It's not -- there's nothing in there in the actual protocol, and you have to have that in there if you want somebody to do it. You can't just say this, and not give them any examples or anything.

Q. When you say it's a definition, what you're saying is they don't pride a framework for actually calculating birefringence?

A. No. A protocol, you're supposed to be able to do -- you know, you're supposed to be able to follow it. It's, you know -- I'll use an example. They say that it's -- in order for it to be asbestiform and asbestos, the structures have to have high tensile strength. That's one of the criteria. Well, it's absolutely impossible to measure the tensile strength on a transmission electron microscope. It's absolutely impossible to measure the tensile strength in a polarized light microscopy. And as it turns out, tremolite anthophyllite have low tensile strength.

It says that you should have a -- you have a population to see if it's asbestos or not. "Population" is not defined, not two, not five, not six, whatever somebody feels like. It's not in the method. If it's just not in the method, it's not something you're supposed to do.

Page 247

Q. So, let's move on just a little bit.

THE COURT: Was the second part of that question answered or did I miss it? Was it accepted, and I think you asked whether it was published --

MR. BRALY: Oh, I said published in --

THE COURT: -- in EPA R-93.

A. Yeah, EPA, yes.

Q. This lends support to what you're saying, is what I was getting at?

A. Yes.

Q. Are the findings of J&J consistent with the birefringence calculations that you performed on the California chrysotile and, again, this is from Exhibit 28; this is the birefringence calculation of the SG-210 Calidria?

A. Yeah, and everything you see there that has a B on it, it was done in bentonite clay.

Q. Okay. Are the findings of J&J, of the chrysotile found in J&J by PLM using the ISO 22262 methodology, are they consistent with the Calidria?

A. They are. If you look at -- if you look at the two rows, the higher, the higher

Page 248

refractive indices on the right side and the lower refractive indices on the left side and if you go through there, you'll see the majority of what we have is we have an average of 1.565 to 1.569 for the CSM ones, and pretty close to 1.562 to 1.570. That's where everything lands. This is the bentonite. So it doesn't have talc. It doesn't have all this other stuff in it. You could have brucite, but brucite is probably the easiest mineral to identify and not get confused with it 'cause they do elongation. So, if you are looking at your microscope like this, you have it tilted 45 degrees, it's blue, it's got blue on it. If you do that with brucite, it is yellow. And you turn the brucite the other way, it's blue. So, brucite has never been an issue for any analyst that does this kind of work.

THE COURT: We're going to wrap it up here today.

MR. BRALY: Yeah, I could get done in 15 minutes but --

THE COURT: No.

MR. BRALY: Okay.

THE COURT: Wrap that up tomorrow morning.

MR. BRALY: Very good.

Page 249

THE COURT: All right. It's just going to take time for everyone to leave.

MR. BRALY: Very good.

THE COURT: So, could I just see counsel real quickly?

Thank you, Dr. Longo.

THE WITNESS: Thank you, Your Honor.

THE COURT: See you tomorrow.

THE WITNESS: Am I excused?

THE COURT: For today.

THE WITNESS: Yes, I'm not going anywhere.

THE COURT: Off the record.

(Proceedings adjourn: 4:15 p.m., Eastern Standard Time.)

CERTIFICATE OF OFFICER

I CERTIFY that the foregoing is a true and accurate transcript of the testimony and proceedings as reported stenographically by me at the time, place and on the date as hereinbefore set forth.

I DO FURTHER CERTIFY that I am neither a relative nor employee nor attorney or counsel of any of the parties to this action, and that I am neither a relative nor employee of such attorney or counsel, and that I am not financially interested in the action.

Andrea Nocks CCR CRR

ANDREA NOCKS, CCR, CRR
Certificate No. X100157300
Certificate No. XR00011300

New Jersey Rules Governing Civil Practice

Part IV, Rule 4:14

Depositions Upon Oral Examination

4:14-5. Submission to Witness; Changes; Signing

If the officer at the taking of the deposition is a certified shorthand reporter, the witness shall not sign the deposition. If the officer is not a certified shorthand reporter, then unless reading and signing of the deposition are waived by stipulation of the parties, the officer shall request the deponent to appear at a stated time for the purpose of reading and signing it. At that time or at such later time as the officer and witness agree upon, the deposition shall be submitted to the witness for examination and shall be read to or by the witness, and any changes in form or substance which the witness desires to make shall be entered upon the deposition by the officer with a statement of the reasons given by the witness for making them. The deposition shall then be signed by the witness. If the witness fails to appear at the time stated or if the deposition is not signed by the witness, the officer shall sign it and state on the record the fact of the witness' failure or

refusal to sign, together with the reason, if any, given therefor; and the deposition may then be used as fully as though signed, unless on a motion to suppress under R. 4:16-4(d) the court holds that the reasons given for the refusal to sign require rejection of the deposition in whole or in part.

DISCLAIMER: THE FOREGOING CIVIL PROCEDURE RULES ARE PROVIDED FOR INFORMATIONAL PURPOSES ONLY. THE ABOVE RULES ARE CURRENT AS OF APRIL 1, 2019. PLEASE REFER TO THE APPLICABLE STATE RULES OF CIVIL PROCEDURE FOR UP-TO-DATE INFORMATION.